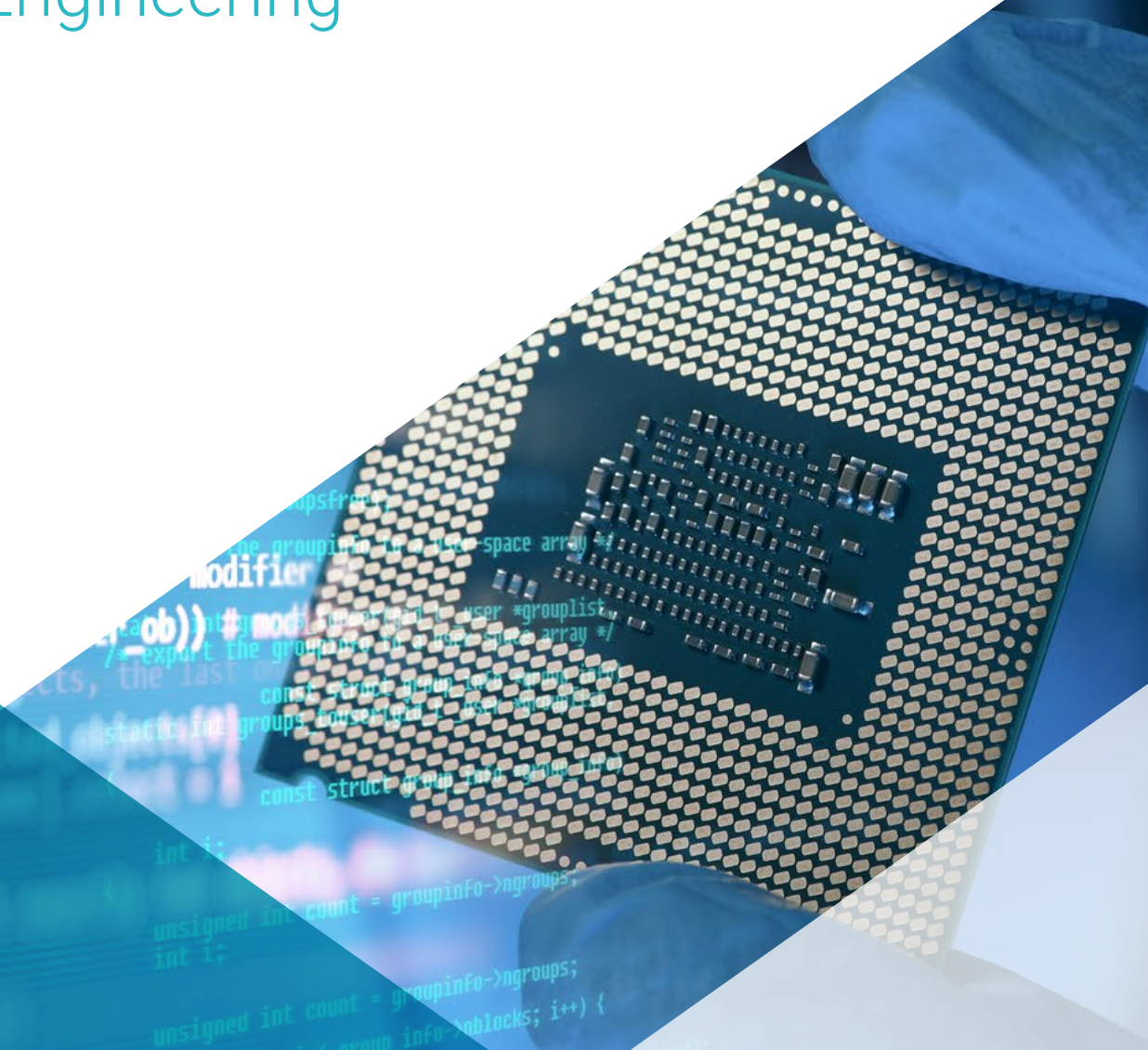


# Internship Program

## Artificial Intelligence and Knowledge Engineering





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Internship Program  
Artificial Intelligence and  
Knowledge Engineering

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# 01 Introduction

The development of technology and the advances that have been made in Artificial Intelligence have allowed its application in multiple sectors such as health, finance, transportation or education among others through Knowledge Engineering. Expert systems and the instructional and computational methods that compose them are becoming increasingly complex, enabling the encoding of human thought so that it can be processed by a machine more effectively. The broad expectations for the future of this field, as well as its various adaptations is what has led TECH to create this program through which the graduate will be able to improve their skills in this field of Computer Engineering.



*Improve your skills in this field of  
Computer Engineering, through  
a first level Practical Program”*







To this end, they will have 120 hours of internship in a prestigious international company, where they will not only be able to work side by side with specialists in this area, but will also have the opportunity to actively participate in the projects that are being developed at that time. In addition, in order to guarantee a totally rewarding and productive experience, the student will have the support of a tutor, who will guide them during the 3 weeks and will ensure that the objectives for which this Internship Program was designed are reached.

“

*Enjoy an intensive 3-week stay in a reputable center and get up to date on the latest procedures to achieve professional growth”*

# 02

## Why Study an Internship Program?

Currently the field of Artificial Intelligence is growing, although given its complexity and constant technical updating, it requires advanced and practical knowledge on the part of professionals. Therefore, TECH has created this program, which gives a real answer to the needs of specialists, who want to be aware of the latest developments in this field and in a first class environment. In this way, this Internship Program gives you the opportunity to have access, during 3 intensive weeks, to a company dedicated to Artificial Intelligence and Knowledge Engineering. A place where you will be, at all times, guided by the best experts in the field, who will show you everything you need to know to progress in this sector.



*TECH offers you a unique program in the academic panorama that gives a real answer to the needs of computer professionals in the field of Artificial Intelligence and Knowledge Engineering”*

### 1. Updating from the Latest Technology Available

New technologies are the basis of Artificial Intelligence and Knowledge Engineering. That is why TECH brings, through this Internship Program, the latest software used for its development. This will be possible, thanks to the immersion in an entity dedicated to this branch and that has in its team excellent experts in this field

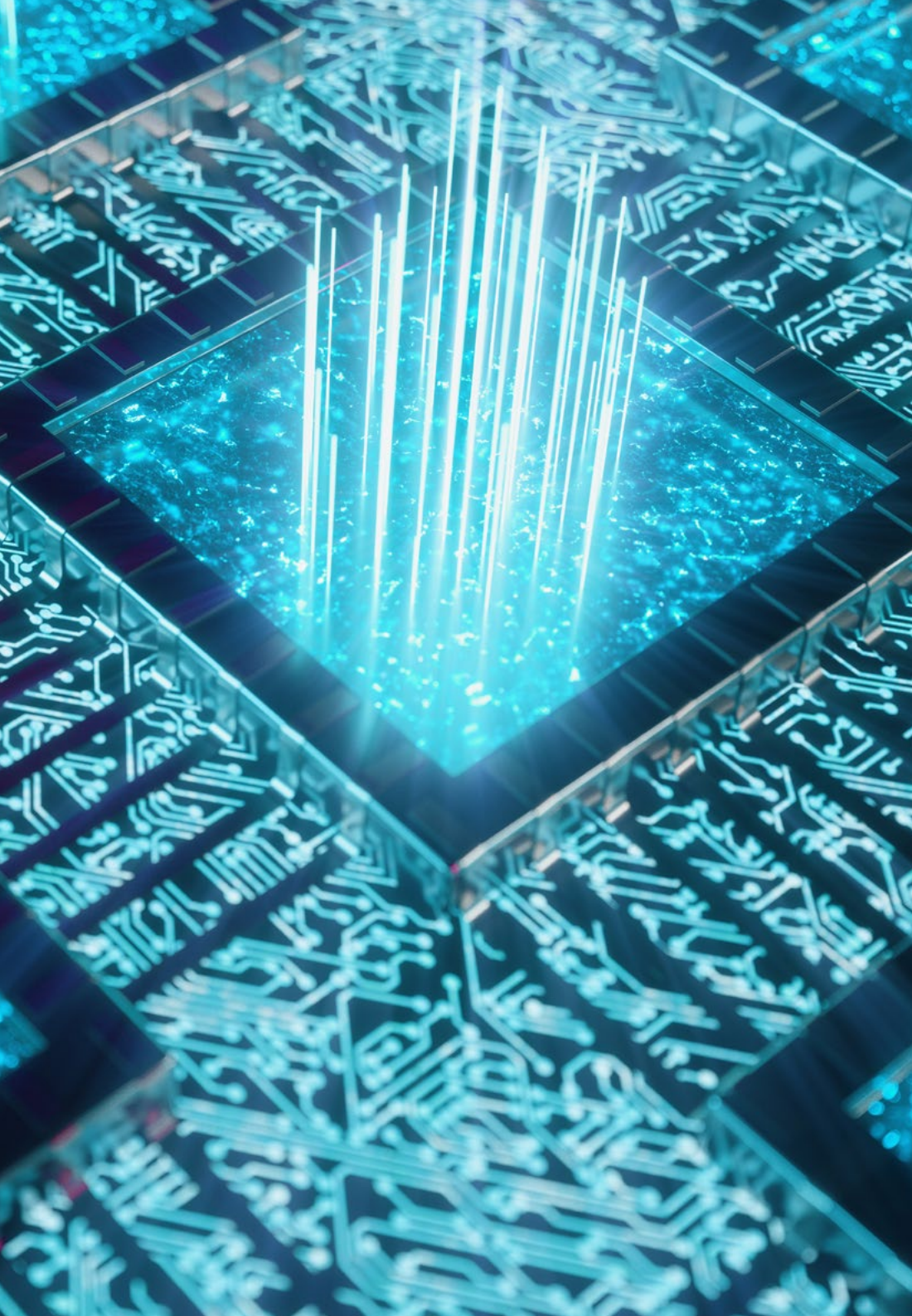
### 2. Gaining In-depth Knowledge from the Experience of Top Specialists

TECH brings you closer to the latest innovations in Artificial Intelligence and Knowledge Engineering through the best specialists in the area. This will be possible, thanks to the intensive stay, which will develop in a leading company in the sector, and which is made up of an excellent team of professional experts in this field.

### 3. Entering first-class environments

Students who enter this program will be guaranteed access to a leading company in the field of Artificial Intelligence and Knowledge Engineering. For their selection, TECH has carried out a thorough selection process of all the companies that are part of the Internship Program. This will allow you to test the latest advances in this area in a world-class professional environment..





#### **4. Putting the acquired knowledge into daily practice from the very first moment**

Practice is undoubtedly the main asset of this program, where the professional will be able to deploy his knowledge, as well as improve their skills, in a face-to-face stay, in a professional environment of maximum demand. In this way, from the first day and throughout the 3 weeks of this program, the professional will be able to increase their level of competence.

#### **5. Expanding the Boundaries of Knowledge**

TECH offers the possibility of doing this Internship Program, not only in national, but also in international companies. This gives the professional a much broader view of a sector of Artificial Intelligence and Knowledge Engineering, which very few companies have mastered, and to which the students will have access.



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



# 03 Objectives

The general purpose of this program is to provide the graduate with scientific and technological skills for the practice of Computer Engineering through the acquisition of a broad knowledge of the field of computing and the structure of computers. In addition, its purpose is also to allow the specialist to acquire the skills of a software expert, as well as the mathematical, statistical and physical competences essential to master this subject.



## General Objectives

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- Learn the latest techniques and software used in the creation of Artificial Intelligence
- Update knowledge on the creation of machine learning, the use of data mining and multi-agent systems
- Learn the latest developments in the programming language



*You will be able to complete this Internship Program having achieved your most ambitious objectives with total guarantee”*







## Specific Objectives

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- ♦ Understand the basic structure of a computer, software and general-purpose programming languages
- ♦ Learn to design and interpret algorithms, which are the necessary basis for developing computer programs
- ♦ Understand the essential elements of a computer program, such as the different types of data, operators, expressions, statements, I/O and control statements
- ♦ Understand the different data structures available in general purpose programming languages, both static and dynamic, and to acquire the essential knowledge for file handling
- ♦ Know the different testing techniques in computer programs and the importance of generating good documentation together with good source code
- ♦ Learn the basic concepts of the C++ programming language, one of the most widely used languages in the world
- ♦ Learn the basics of programming in the C++ language, including classes, variables, conditional expressions and objects
- ♦ Understand abstract data types, linear data structure types, simple and complex hierarchical data structures, as well as their implementation in C++
- ♦ Understand the operation of advanced data structures other than the usual ones
- ♦ Learn the theory and practice related to the use of priority mounds and queues
- ♦ Learn the operation of Hash tables, such as abstract data types and functions
- ♦ Understand Graph theory, as well as advanced Graph algorithms and concepts
- ♦ Learn the main strategies for algorithm design, as well as the different methods and measures for algorithm computation
- ♦ Know the main sorting algorithms used in software development
- ♦ Understand the operation of different algorithms with trees, heaps and graphs
- ♦ Understand the operation of Greedy algorithms, their strategy and examples of their use in the main known problems. Learn the use of Greedy algorithms on graphs
- ♦ You will learn the main strategies of minimum path search, with the approach of essential problems of the field and algorithms for their resolution
- ♦ Understand the backtracking technique and its main uses, as well as other alternative techniques
- ♦ Delve into advanced algorithm design, analyzing recursive and divide-and-conquer algorithms, as well as performing amortized analysis
- ♦ Understand dynamic programming concepts and algorithms for NP problems

# 04 Educational Plan

When TECH and its team of experts decide to undertake this program, they do so thinking of providing the graduate with another opportunity to continue growing professionally, while expanding their future possibilities. To this end, they have decided to create an eminently practical experience in a prestigious center, developed over 3 weeks and distributed in 120 hours, in which the student will have to go to the company from Monday to Friday in consecutive 8-hour days.

In this program, the activities are directed to the development and improvement of the necessary competences for the provision of activities related to Artificial Intelligence and Knowledge Engineering, and which are focused on the specific endowment for the exercise of the profession, with a high professional performance.

It is, therefore, a unique and incomparable opportunity to work on improving your skills and aptitudes with a team of experts who will ensure that you acquire the broadest and most specialized knowledge possible. Therefore, you will be able to shape your professional profile and implement the most innovative, complex and effective programming and computing strategies in your praxis, adapting your qualities to the current demand of the business sector.

The practical teaching will be carried out with the active participation of the student performing the activities and procedures of each area of competence (learning to learn and learning to do), with the accompaniment and support of teachers and other fellow students to facilitate teamwork and multidisciplinary integration as transversal competencies for advanced computer praxis (learning to be and learning to relate).



*Receive specialized education in an institution that can offer you all these possibilities, with an innovative academic program and a human team that will help you develop your full potential"*



The procedures described below will be the basis of the practical part of the training, and their implementation will be subject to the center's own availability and workload, the proposed activities being the following:

Module	Practical Activity
<b>Programming and Data Structuring</b>	Develop algorithms of different types
	Understand both dynamic and static data structures of programming languages
	Use testing techniques in computer programs
	Implement in C++ different types of data structures
	Understand more advanced data structures
	Use Hash tables
<b>Algorithm Design</b>	Use Greedy algorithms in common programming problems
	Backtracking and other alternative techniques in running algorithms
	Develop specific algorithms to cover specific problems of the project performed
	Develop advanced algorithms, making use of effective analysis for this task
	Perform formal program verification
	Optimize algorithms with combinatorial techniques
<b>Artificial Intelligence and Knowledge Engineering</b>	Use of artificial intelligences in different contexts
	Use genetic algorithms in the creation of artificial intelligences
	Program Artificial Intelligences based on the required context
	Create ontologies with specific language and software in intelligent systems
	Develop an agent architecture in intelligent systems
	Use knowledge-based expert systems and semantic webs
<b>Create machine learning, data mining and multiagent systems</b>	Develop in the use of simple and recurrent neural networks
	Use data preprocessing with decision tree-based algorithms
	Use confusion matrices and numerical evaluation to classify and evaluate classifiers
	Run multi-agent systems according to their own architecture
	Program and develop multi-agent systems with JADE



# 05 Where Can I Do the Internship Program?

This program includes 120 hours of practical experience in a leading international company. Thanks to this, the graduate will be able to develop professionally by working actively with a team of specialists in this sector and learning from their wide and extensive experience. In addition, you will have the support and supervision of a tutor who will ensure that the experience is as enriching and rewarding as possible.

“

*You will be able to include in your resume a work experience in a prestigious company in the Computer Engineering sector”*







The student will be able to do this program at the following centers:



information-technology

### Grupo Fórmula

Country	City
Mexico	Mexico City

Address: Cda. San Isidro 44, Reforma Soc,  
Miguel Hidalgo, 11650 Ciudad de México, CDMX

Leading company in multimedia communication  
and content generation

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**Related internship programs:**

- Graphic Design
- People Management



*Make the most of this opportunity to surround yourself with expert professionals and learn from their work methodology”*

# 06

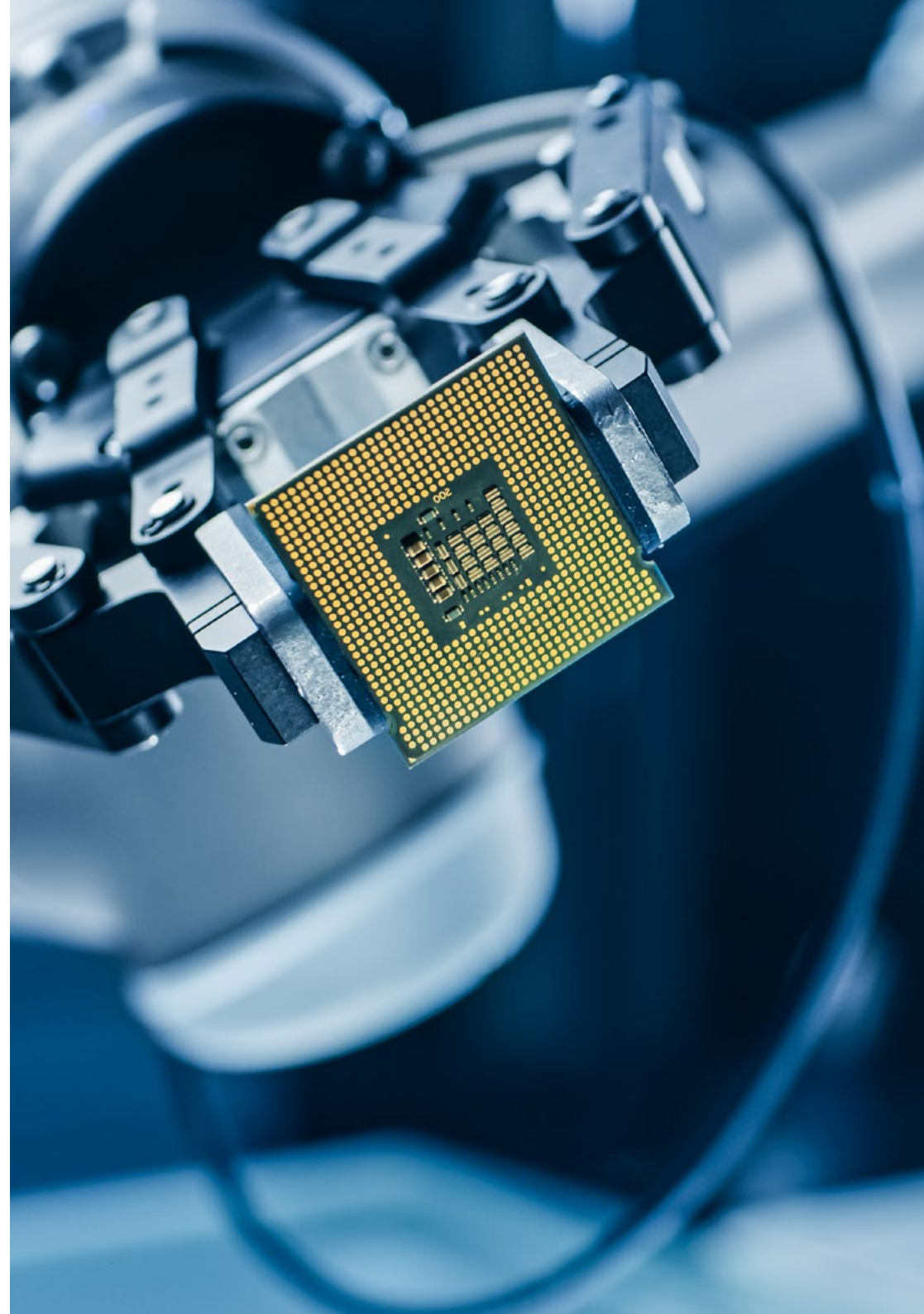
## General Conditions

### Civil Liability Insurance

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

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

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





## General Conditions of the Internship Program

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

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

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

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

**4. CERTIFICATION:** Professionals who pass the Internship Program will receive a certificate accrediting their stay at the center.

**5. EMPLOYMENT RELATIONSHIP:** The Internship Program shall not constitute an employment relationship of any kind.

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

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

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

# 07 Certificate

This **Internship Program in Artificial Intelligence and Knowledge Engineering** contains the most complete and up-to-date program on the professional and academic scene.

After the student has passed the evaluations, they will receive their corresponding TECH Internship Program issued by TECH Technological University via tracked delivery.

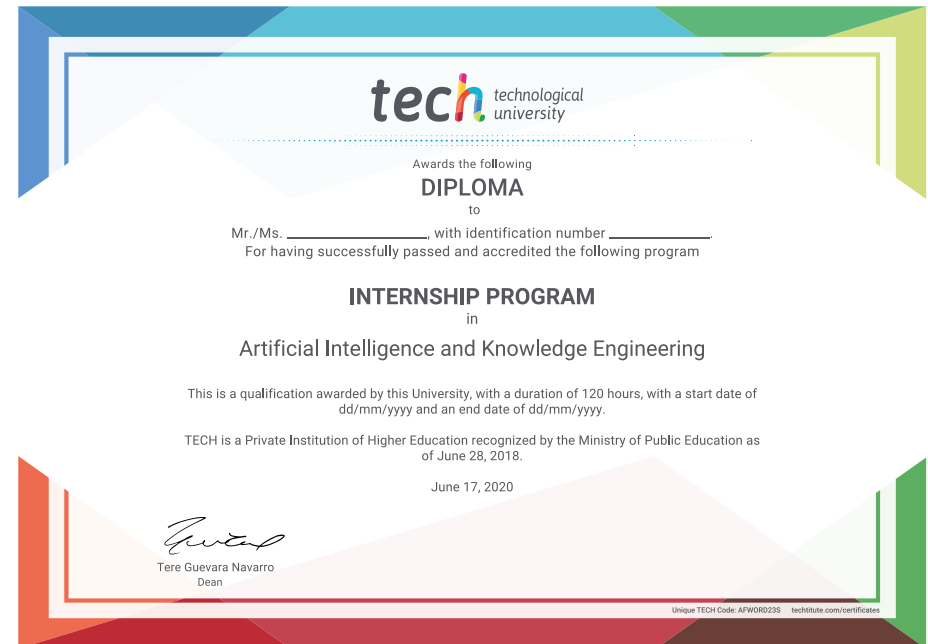
The diploma issued by TECH will reflect the grade obtained in the test.

Title: **Internship Program in Artificial Intelligence and Knowledge Engineering**

Duration: **3 weeks**

Course Modality: **Monday to Friday, 8-hour consecutive shifts**

Total Hours: **120 h. of professional practice**



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Artificial Intelligence and  
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# Internship Program

## Artificial Intelligence and Knowledge Engineering

A close-up, blue-tinted photograph of a printed circuit board (PCB) being inspected by a probe. The probe tip is in contact with a component on the board. The board features various components, including integrated circuits and connectors, with labels and markings. The image is overlaid with a teal and white geometric design.

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