

# AthenAI

Institute  
of Technology

## Top Technical Lawyer Essential → Top



New Technologies  
applied to Law &  
Law applied to  
New Technologies

1st Edition



# AthenAI

# Contents





<b>1</b>	<u>AthenAI Institute of Technology</u>	4
<b>2</b>	<u>Our platform</u>	11
<b>3</b>	<u>A UNIQUE Program</u>	15
<b>4</b>	<u>Program Structure</u>	24
	Year 1 ≈ Essential	27
	Year 2 ≈ Top	33
<b>5</b>	<u>Certifications</u>	41
<b>6</b>	<u>Career Opportunities</u>	45
<b>7</b>	<u>Faculty of Experts and Instructors</u>	50
<b>8</b>	<u>General Information</u>	54

AthenAI

1

# AthenAI Institute of Technology

A school for those who ***truly want to learn*** and are ***willing to put in the effort.***



## Why study at AthenAI?

AthenAI is a School with an international presence, but it is NOT a school for everyone.

*"AthenAI is the school for those who have a true desire to learn and the courage to take on real challenges."*

### A school for those who are not seeking degrees, but transcendence.

In a context saturated with quick formulas and superficial education, AthenAI was born with the vocation of being a knowledge and technology boutique...

- A **selective, demanding institution, fully committed** to the major challenges of the present and the future.
- A **school of technological excellence** aimed at those seeking **deep, rigorous, and authentic learning**.
- Aimed at **students willing to face real challenges** and walk a path **full of obstacles** in order to achieve transformative learning.
- Where **there is no place for those seeking shortcuts or quick solutions** empty of substance.
- Where **we train leaders who leave a lasting mark** through knowledge, effort, and a genuine commitment to their own development and the world around them.

### Where failure is a real possibility

We believe that true learning involves taking risks, stepping out of one's comfort zone, and facing the real possibility of failure, which is why—**unlike other schools—failing here is possible**.

Because mediocrity is born when there are no consequences, at AthenAI we believe that those **who aspire to lead must face the challenge of failure before achieving success**.

*"Enrollment means having an opportunity to surpass the program.  
Not the guarantee of doing so."*

### Our fundamental pillars: Knowledge, Reputation, and Purpose

We are committed to **high-impact training**, based on **challenging projects** and a **network of strategic contacts that generate real opportunities**. Because those who choose our school do not want to follow the traditional path—they come to us to:

- Reinvent themselves
- Launch their own start-up
- Build the next unicorn
- Become a Forbes cover story

All of this is possible thanks to the three pillars that sustain our educational model: **Knowledge, Reputation, and Purpose**.

# Pillar 1. Knowledge

## Excellence of the faculty

It is **our most valuable asset**, which is why we devote special time and attention to its rigorous selection process. Each professor has been carefully chosen based on three key criteria:

- Their deep knowledge in the area they teach.
- Their ability to transmit all that knowledge to students.
- Their real-world experience in company projects.

This approach ensures high-level training, connected to professional reality and designed to deliver transformative, high-impact learning.

## Personalized Tutorial Support

Our programs are designed to provide high-performance training, in which students continually apply the knowledge acquired in practical situations. For this reason, **tutorial support is an essential part of our pedagogical approach**.

Students will have access to our exclusive platform, where they will find all relevant documentation, practical exercises, and a forum where they can raise their questions and concerns. Additionally, **they will be able to communicate directly with all faculty members** via email and schedule tutorials flexibly. They will also **have access to the mobile phone of the Academic Director**, allowing them to resolve any urgent matter immediately.

Practical activities are designed to represent a real challenge for students. Therefore, the teaching staff maintains **constant contact with each student, evaluating their progress**. If a decline in academic performance is observed, we meet personally with the student to identify the cause—whether it is lack of study or any other factor affecting their progress.

**Each student will have an assigned tutor who will accompany and guide them throughout the entire program**, ensuring continuous learning and personalized support.

## Constant content updates

Unlike other business schools, **updating our programs** is not a promise—it is a **fundamental principle**.

**Each new edition, we thoroughly review and adapt the entire program** to incorporate the latest trends, the most relevant technological advances, and the current challenges of the sector.

We rely on the direct participation of key players from major technology companies, who **share with our students the latest published papers** (Google, Microsoft, Meta, Amazon, etc.). This ensures that the content of each edition is unique, fully updated, and aligned with the real state of the market.

## Programs certified by the main technology entities

Our programs are designed so that students, in addition to acquiring cutting-edge knowledge, can **obtain the most recognized national and international certifications**.

## Immersive and practical methodology

*“Our training is not limited to transmitting knowledge:  
Here, it is lived, practiced, and demonstrated.”*

Learning means evolving, which is why students immerse themselves from day one in an **engaging experience** where they “learn with their hands”:

- They **attend practical, dynamic, and rigorous classes** that combine essential theory with practical exercises and challenges of increasing difficulty.
- They must **complete a practical assignment at the end of each knowledge block** (there is no theoretical exam), designed to challenge even the most advanced profiles. These assignments **simulate real professional problems and environments**, ensuring that students not only understand the concepts, but test their ability to apply what they learn in concrete situations they will face in their future careers.
- They will have **3 weeks to complete and submit these assignments**, researching and testing different approaches until they manage to solve each exercise. This type of learning stays with them for life, unlike inefficient theoretical exams.
- They must have a **passing average grade (5)** across all assignments in order to present the Final Master's Project, which will consist of **designing a financial service using AI and Big Data**, to be defended before a panel.
- They always have access to the **same tools they will use in their professional life**: notes, the internet, forums, tutors, class recordings, access to ChatGPT, etc.
- They **develop and deploy services in production**, because theory is useless if it is not put into practice. They have access to a community designed to generate high-performance teams capable of developing their ideas and bringing them to the market.
- They **certify, compare, and evolve** their knowledge and skills.
- They **collaborate and compete with other students** in a safe and stimulating environment.
- They build a **high-value network**, sharing experiences with classmates who will become strategic contacts in their career evolution... and lifelong friends.
- They make **decisions with real impact on their trajectory and reputation** within the community: grades matter during training, but reputation will matter throughout their life.

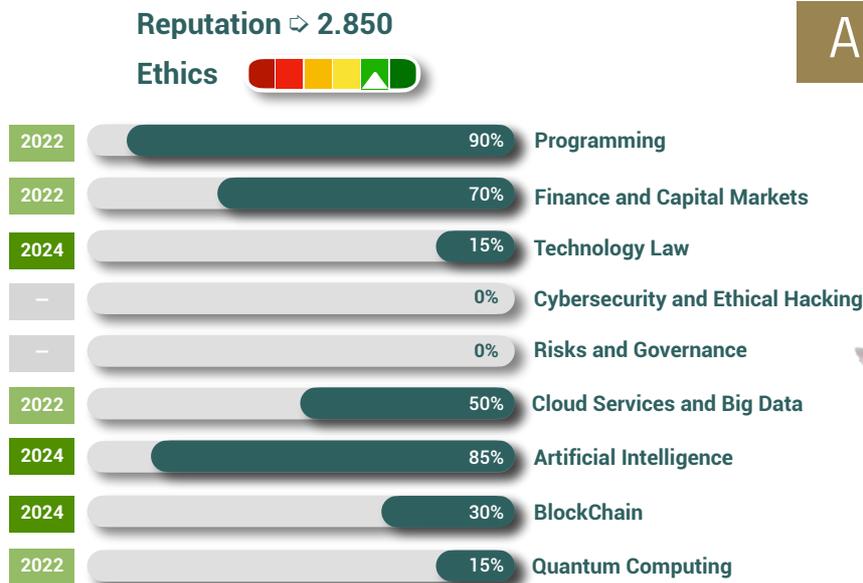
## Pillar 2. Reputation

### Reputation and ethics as a measure of prestige

A person may be an excellent student but lack ethics, which is why it is crucial that knowledge and reputation are properly differentiated and valued independently.

**Reputation** must be closely linked to the participant's behavior—toward their peers and toward the school. It is not only about what they know, but how they act and **how they contribute to the academic and professional environment**.

## Where your profile speaks for you



Alba Hernández



Every action, achievement, completed assignment, and challenge overcome by the student is **100% real and accessible to all participants**, as it is recorded on their **public profile**.

This profile is **based on the student's merits, competencies, and ethics, previously verified by the school**, so it faithfully reflects their evolution and becomes a professional presentation card—inside and outside the community.

*"You will know the strengths and weaknesses of other participants...  
but they will also know yours."*

In each student's profile, **you can consult their level of knowledge, their reputation, and the certifications** obtained. Additionally, **knowledge will reflect the year in which it was acquired**, so constant updating will be essential.

This approach turns the AthenAI experience into one that is:

- **Transparent** ↗ Results are visible and authentic, based on verified merits and competencies.
- **Transformative** ↗ It accelerates skill acquisition and maintains student commitment from day one until graduation.
- **Human and connected** ↗ It enables an environment of transparent and authentic interactions, creating professional and personal bonds that accompany the student throughout life.

## Content updates for graduates

*"An education that does not end with the last class..."*

Given the accelerated pace of obsolescence in many areas of study within our master's programs, we offer our graduates ongoing access to continuous, relevant updates of the content they studied.

Our *alumni* are natural ambassadors of our programs. Their professional success and satisfaction with the training received strengthen the reputation of the master's program and attract new students.

Once **a master's is completed, grades lose importance**; what truly matters is **reputation, which must continue to be visible and evolving**. Reputation will become **a currency of value for professional growth**, allowing graduates to obtain:

- Discounts on future training and master programs.
- Attendance at international conferences.
- Free content updates.

### Factors that influence reputation

- Contributing to the learning of others: responding to student questions in the school forums, helping create an environment of collaboration and mutual support.
- Publishing research or papers together with the school, sharing your knowledge with the academic and professional community.
- Actively participating in school competitions, demonstrating your ability and commitment in practical and challenging contexts.
- Sharing your personal experience on social media, posting videos and testimonials about your journey in the school, inspiring others and positioning yourself as a reference.
- Developing innovative projects and services in collaboration with the school, providing concrete solutions that benefit the community.
- Attracting new students, recommending the school to future candidates and acting as a brand ambassador.
- Collaborating in school events and activities, participating in conferences, seminars, or mentoring sessions that reinforce your role as a leader within the community.

### Factors that influence ethics

- Negatively affecting the image of the school, whether through destructive attitudes, malicious comments, or actions that harm its prestige.
- Maintaining unethical or violent behaviors, such as dishonest practices, unnecessary conflicts, or attitudes that compromise personal or institutional integrity.
- Ignoring community rules, violating academic, ethical, or behavioral policies that govern the school.
- Discrediting peers or community members, generating unjustified conflicts and contributing to a toxic environment.
- Showing disinterest or abandoning commitments, leaving projects or tasks unfinished and harming collective work.

## Pillar 3. Purpose

### Improving employability and working conditions

The level of rigor in our programs, along with the constant updating of their content, turns our graduates into an **exceptional talent pool, highly sought after** for specific positions at high-responsibility levels (C-Level) or in technological or cybersecurity laboratories, both in the public and private sectors.

Thanks to our close collaboration with these laboratories, students **can work on real projects and participate in strategic challenges** proposed by leading institutions, significantly **increasing the job placement opportunities of our graduates**.

*“Our objective is to ensure that the employability of our graduates, nationally and internationally, is close to 100% in relevant positions.”*

### Creating AI experts

**Most programs seek to create advanced AI users** ⇨ A user depends on third-party software.

**Our objective is to create AI experts** ⇨ An expert is capable of creating their own AI software, from design to production deployment, and adapting it to solve any task they undertake.

*“Our goal is to teach how to develop AI, not just how to use AI.”*

### A school with a soul

AthenAI was born from the mind of Zeus, combining **knowledge, arts, justice, and strategy**. Its name not only evokes wisdom, but also determination and character.

Our school was founded with a clear, shared purpose: **to inspire our students to transcend the personal and create real impact in the world...**

*“Build something you believe in.”*

*It is not only about studying, but creating.*

*It is not about working, but leading.*

*It is not only about teaching, but transforming the student into their best version.*

*It is about separating leaders from those who are not.*

*Here begins your story*

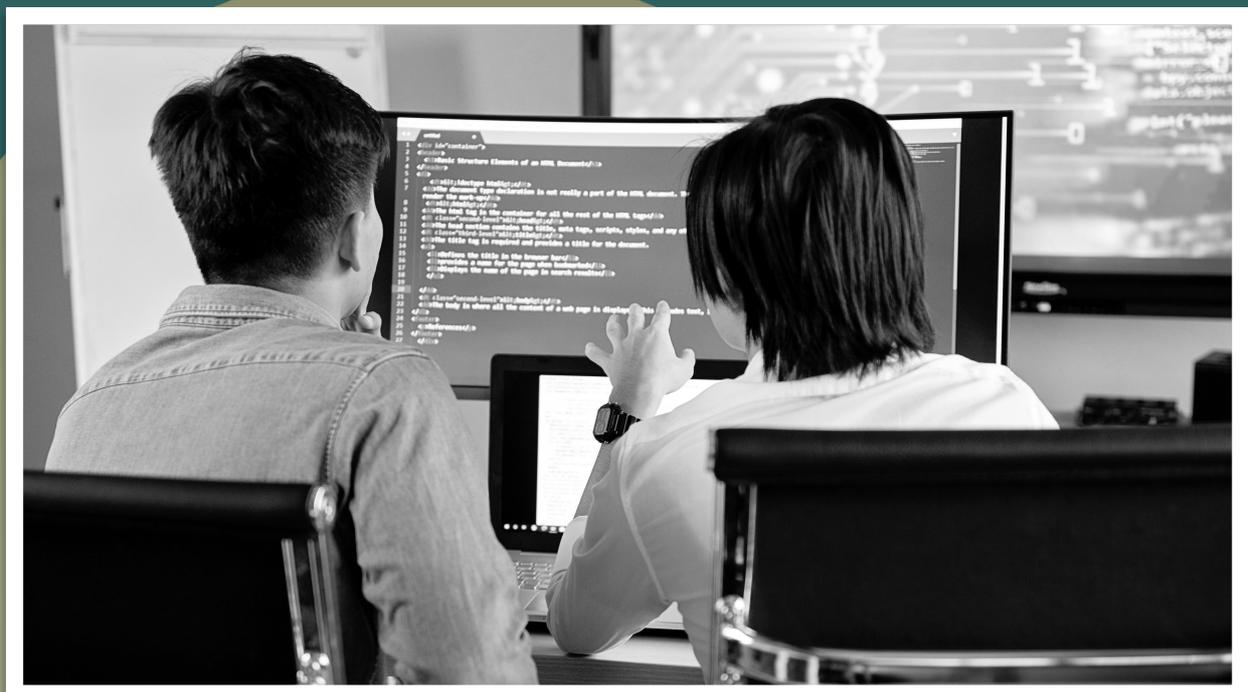
**Welcome to AthenAI**

# AthenAI



## Our platform

***Much more than a virtual classroom:*** a living digital ecosystem, designed to drive learning, collaboration, and continuous professional growth, beyond the classroom and throughout the entire journey of our students.



# The perfect ecosystem for unlimited education

We transform the educational experience into a dynamic, demanding, deeply realistic, and future-oriented environment that **maintains the motivation and focus of our students**.

Our methodology is not only advanced, rigorous, and challenging. We ensure that **each student evolves within an ecosystem meticulously designed for success**:

*"When learning becomes an immersive experience, knowledge turns into action and results become tangible."*

Our educational platform has been created as a **constantly expanding ecosystem, where** ideas come to life and where **every interaction connects you with new opportunities**: learning, sharing, collaborating, competing, innovating, growing, projecting yourself professionally...

It is not just another virtual classroom. It is a living digital environment that provides the necessary tools to **maximize learning and students' professional development, accompanying them throughout their entire journey** (as students and as active professionals), allowing them to continue growing long after they have completed their training and to belong to a global community that never stops evolving.

## 1. The School: The academic core of the ecosystem

Within the *School* space, students have access to all the tools necessary **to manage and enhance their learning**:

- **To consult their progress in the programs** in which they are enrolled, as well as in those already completed. They will also be able to view the percentage of credits that can be validated for programs in which they are not enrolled.
- To access live online classes, recordings of completed sessions, consult the session calendar, review their grades, submit assignments, request tutorials with their professors...
- To progress flexibly in their education, being able **to enroll in new programs** and use their accumulated reputation as a currency to obtain academic discounts and benefits.
- Graduates will be able to access subsequent updates to the materials (notes, exercises, and videos from the latest editions) through a small annual fee. In addition, they will be able to **recertify in specific areas of knowledge** to keep their professional profile up to date and to demonstrate the validity and evolution of their competencies.

## 2. Community: An exclusive network, unique of its kind

The *Community* **is the heart of the ecosystem, a selective and exclusive club** inspired by international institutions of excellence such as **Mensa** or **Forbes**, where access is restricted and standards of excellence are exceptionally high.

Students, mentors, and graduates interact within **a living, dynamic, and transparent network**, generating synergies, opportunities, and challenges. A space where learning is expanded through collaboration and collective intelligence, where members can:

- **Connect with students and graduates from any program**, share experiences, resolve questions, or propose projects.
- **Participate in debates, collaborate on projects, answer questions** from other peers, or **request a direct meeting** with any member of the network.

- **Consult any profile** 100% verified by the School, guaranteeing the authenticity of shared knowledge and fostering an environment of trust and prestige.
- **Access reputation and knowledge-area rankings**, identify the top profiles in each field, and discover how to improve their positioning within the community, stimulating healthy and enriching competition.
- **Increase their reputation with every valuable** contribution they make to the community, expanding their training opportunities, collaboration possibilities, and professional visibility.
- **Build solid and long-lasting relationships** that will impact their prestige and professional and personal development.

### 3. Competitions: Learning turned into challenge

*Competitions* allow students to **apply acquired knowledge in real and stimulating environments**, challenging them to overcome problems in areas as diverse as financial markets, cybersecurity, law, or climate prediction, as well as new topics proposed by students or partner companies.

Each participant **may compete individually or join a team**, lead proposals, or even **create their own competition**, under the academic supervision of the School. It is another way to demonstrate creativity, talent, and leadership ability to the community and to partner companies, gaining reputation in the process.

### 4. Library: Open, shared, and validated knowledge

The *Library* is a space where knowledge is democratized. A living collective repository, constantly growing, offering **access to a wide collection of academic materials**: notes, summaries, exercises, practice examples, papers, videos, and resources created by both professors and students.

Each validated resource enriches and supports the community, **contributing to the reputation of the contributor**.

Here, learning is not limited to classes: it is expanded through the ideas, curiosity, and generosity of the entire academic community.

### 5. SOFIA: The intelligence of talent

*SofIA* is the space reserved for **top-of-the-class students and program directors**.

Its mission is to identify and channel exceptional talent toward **high-impact strategic projects**.

An exclusive environment where the brightest minds connect with the **most innovative and ambitious opportunities**.

### 6. LARA: Where ideas become companies

Our *start-up accelerator* allows graduates to present innovative projects and **access mentorship, regulatory sandboxes, and investment opportunities (Business Angels)**.

Through our network of **Business Archangels**, in addition to investment, projects receive expert guidance, real involvement, and hands-on support to launch their initiatives into the market

## 7. SFINGE: Collaboration without borders

*Sfinge* was the first electronic financial services company in Spain and the technological origin of our School, representing one of the most innovative spaces within the ecosystem.

It enables the **creation of multidisciplinary and international teams** capable of developing projects and Master's Final Projects collaboratively, without geographical barriers.

Thanks to advanced search tools, students can identify peers with complementary profiles and form high-performance international teams operating 24 hours a day.

They will be able to build projects that, once consolidated, **can be submitted to the LARA acceleration program to take them to the next level.**

## 8. Job Board: Connecting talent with opportunity

The *Job Board* is designed to **enhance employability and boost professional projection**. It represents the meeting point between the talent trained at the School and companies seeking to incorporate highly qualified profiles.

Graduates of a Top program **may apply for exclusive job offers** or even **create their own positions** if their company is looking to recruit talent trained at the School.

Partner companies **may request knowledge assessments or certifications verified by the School.**

## 9. Strategy Games: Learning by playing

Our ecosystem incorporates a recreational section of *Strategy Games*, **inspired by ancient civilizations** (Egyptians, Vikings, Romans, Celts...), fostering decision-making, strategic thinking, and global tactical vision.

Students **may compete against AI or challenge other peers**, striving to climb the **School ranking** while developing key skills for leadership and management.

## 10. An ecosystem that evolves with its students

Our ecosystem is a network that grows and transforms alongside its students, accompanying them throughout their entire academic and professional lives.

A digital environment that **connects knowledge, innovation, opportunities, and a global community** to drive talent, collaboration, and success.

***"Here, learning does not end when a master's degree finishes:  
it becomes a way of life."***

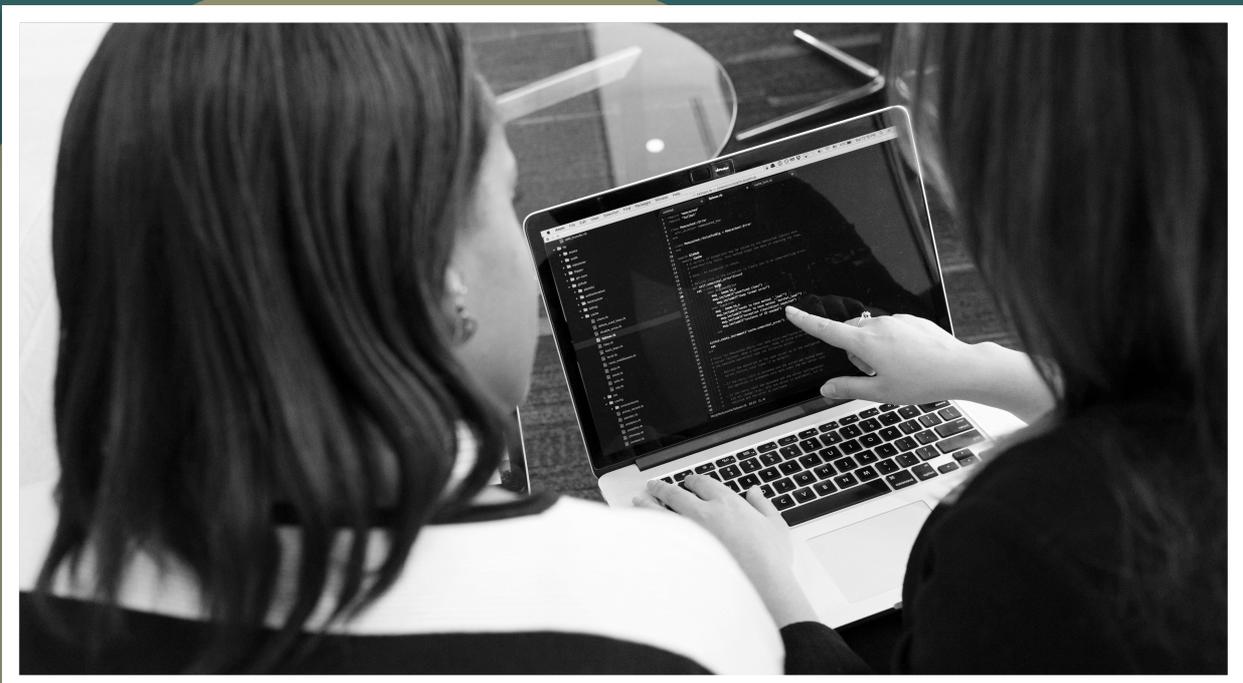
# AthenAI



## A UNIQUE Program

We embrace a dual perspective that makes us  
UNIQUE: Law applied to new technologies and new  
technologies applied to law.

Lead the technological revolution and ***turn AI into a  
revenue stream for your law firm.***



# Top Technical Lawyer: Two Master's Programs That Together Form the Most Comprehensive and Demanding Program in the World

**Top Technical Lawyer: The elite in law, Artificial Intelligence, and emerging technologies.**

**Top Technical Lawyer** is not merely an academic program, it is an intellectual challenge of the highest rigor, designed for those who aspire to lead the future of law in the era of Artificial Intelligence and emerging technologies. With a structure unique in the world, it combines academic excellence, intensive training, and international recognition, positioning itself as the highest standard in advanced education.

By pursuing this program, students may obtain two Master's degrees:

- **Technical Lawyer Essential:** 450 instructional hours, equivalent to 54 ECTS (first academic year).
- **Top Technical Lawyer:** 590 instructional hours, equivalent to 70 ECTS (second academic year).

Additionally, the program includes **three top-level official certifications**, awarded by leading entities in each discipline:

## **Technical Lawyer Essential Certifications:**

- Professional Cloud Architect (PCA), issued by Google

## **Top Technical Lawyer Certifications:**

- Professional Data Engineer (PDE), issued by Google
- Professional Machine Learning Engineer (PMLE), issued by Google

Students may choose to pursue only the **Technical Lawyer Essential program**, one of the most comprehensive and demanding master's programs available, capable of transforming them into highly competitive and distinctive professionals.

Only those who aim to transcend and become true global leaders will take on the **Top Technical Lawyer**. This full program requires prior completion of the Essential level and represents the pinnacle of training in law, Artificial Intelligence, and emerging technologies.

***Top Technical Lawyer is not studied: IT IS CONQUERED.***

## Nature of the Master's Degree – A Dual Perspective

This master's degree was created as a response to a **critical need in the legal sector**: the scarcity of professionals capable of integrating legal knowledge with technological advances. While other traditional law or technology law programs focus solely on the field of law, we create a completely new hybrid profile: **the Technologist Lawyer or Top Technical Lawyer**.

This lawyer of the future must not only understand the law, but also master the emerging technologies that are transforming legal practice, such as **artificial intelligence, blockchain and quantum computing**. Artificial intelligence, in particular, will represent one of the **main revenue streams for law firms in the coming decades**.

In this master's degree, we focus on offering a **dual learning perspective**: on the one hand, we approach technology law from the perspective of legal practice, and on the other hand, we delve into the technological aspects of AI, allowing students to understand how it works and how it is applied in the legal context. This training not only prepares lawyers to understand and manage cases in which technology is involved, but also enables them to **identify business opportunities, optimize processes and generate differential value compared to the competition**.

What distinguishes this master's degree is its **completely professional and practical approach**. It is not about accumulating theory to obtain a degree, but about acquiring the most advanced tools and knowledge, working with **real cases, state-of-the-art technologies and simulations that replicate professional world situations**.

The objective is to train lawyers who, in addition to being legal experts, **deeply understand the technological environments with which they interact**, which will allow them to be key actors in the resolution of complex legal conflicts related to technology. Because in today's world, understanding technological development is not only an advantage, but a **strategic necessity for any lawyer who wants to lead the future of the legal sector**.

The incorporation of AI in law firms is interesting for two reasons:

### The use of AI improves the efficiency of work within a law firm

Search for relevant case law, beyond search engines based on topics or keywords. LLM and LRM models allow a real understanding both of the context provided and of the database with which they operate, which will allow law firms to multiply their efficiency and precision.

Improvement in the formal drafting of legal documents, adapting them, for example, to the **writing style and format that a specific judge prefers**, saving countless hours.

**Regulation classification**: analyzing new regulation and discerning which areas it affects is a process that could be carried out by a neural network, always with subsequent human supervision. In areas such as the financial sector, where numerous regulations are created daily, a tool capable of determining whether this new regulation "affects us" or not could prove not only useful, but a **huge improvement in efficiency**.

### Being able to handle cases in which AI is involved

Is a network with online learning the same as reinforcement learning?

What does it imply that the network is a **descendant of pathways**?

Is **fuzzy logic** within Machine Learning? And within AI? What happens if we combine a **neural network with a swarm algorithm**? Do they have the same legal impact? Do the **user and the manufacturer have the same responsibility**?

What could **I-JEPA** represent in the achievement of **AGI**?

If LLM models do not always produce the same output with the same input, what legal consequences does this have from the point of view of the reproducibility of results in financial services? And from the point of view of supervision and explainability?

**Lambda and consciousness**, the case considered by many to be the case of the century. ChatGPT and subsequent LLM models are based on the same paper. Should we consider that software based on a neural network, such as **RAM**, should have the same legal guarantees as an LLM? What consequences would arise if the **consciousness of an LLM model were recognized**?

Do all the previous examples have the **same degree of legal responsibility for their developers**? And for the companies that have put them into production?

Knowing, in depth, each of the branches of AI, as well as their underlying models, **would allow jurists to take on cases with real knowledge of the subject matter**, knowing how to defend their clients and also how to challenge each of the models used by the opposing party.

## The creation of the technological lawyer figure is necessary for trials derived from conflicts involving AI.

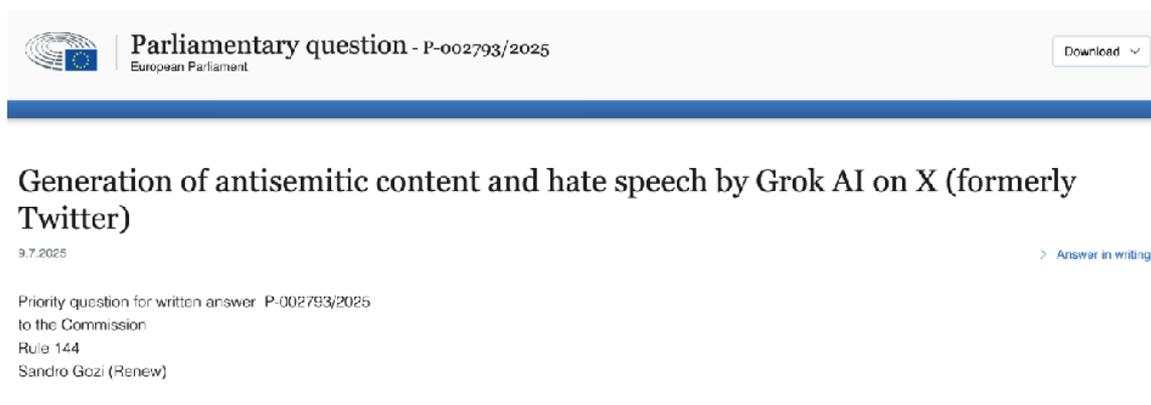
For example, in the financial system it is possible to create fraud detection systems using **autoencoder models** with a detection accuracy between **70% and 75%**. These systems are the ones that are currently being used today.

However, if a **classical Machine Learning model such as XGBoost** is combined with a quantum hybrid model, **Quantum Support Vector Machine**, and the results are introduced into a **Random Forest model** to discriminate the final output, we observe that fraud detection increases to **93%**.

Is the financial institution acting with **Due Diligence** to protect its clients if it uses an AI system that **detects 70% of fraud**, when it is currently possible to detect **93%**?

This trial has not yet occurred. But this legal consultation may reach your law firm at any moment. And a professional profile capable of answering it is necessary.

Or let us think about a **real and recent case**:



The screenshot shows a webpage from the European Parliament. At the top, it says "Parliamentary question - P-002793/2025" with a "Download" button. The main title is "Generation of antisemitic content and hate speech by Grok AI on X (formerly Twitter)". Below the title, it says "9.7.2025" and "Answer in writing". Further down, it identifies the question as a "Priority question for written answer P-002793/2025 to the Commission" under "Rule 144" by "Sandro Gozi (Renew)".

Recent news has confirmed that Grok, the Artificial Intelligence (AI) chatbot developed by xAI and integrated into the social media platform X, published antisemitic content and praised Adolf Hitler. Despite the posts having been removed, the case raises serious concerns about compliance with the Digital Services Act (DSA) as well as the governance of generative AI in the Union's digital space.

- Imagine the reputational damage for X.
- In this case, **Grok has been developed by X**. What legal responsibility does X have? From whom can it demand responsibility? From the employee?
- What would have happened **if Grok had been developed by a third party** and X were "only" a consumer of the AI?
- What would have happened if Grok had been developed by a third party but adapted or retrained by X? Could it demand responsibility?
- Would your law firm be prepared to accept this case? Do you have sufficient knowledge to lead it?

## Objective

The profiles that access this program usually have clear and ambitious motivations. In most cases, their objectives are grouped into three main categories:

- **To boost their professional career**, making a qualitative and quantitative leap, especially in terms of responsibility, projection and salary.
- **To avoid technological obsolescence**, updating and expanding key competencies in a highly dynamic environment, even when already starting from senior or well-paid positions.
- **To enter the labor market with a real competitive advantage**, through rigorous, multidisciplinary and clearly differentiating training.

*This master's degree is not another line on a résumé. It is a turning point.*

## Admission Profiles

This master's degree can be accessed from different profiles:

### a) Legal Profile

If you come from a legal background, you already have advanced knowledge of law. By undertaking this master's degree you will be able to specialize in technology law, one of the most demanded branches by law firms today.

In addition, **you will acquire advanced knowledge from a technical perspective**, including knowledge of **Artificial Intelligence, Python programming, Cloud Services and Blockchain**.

By undertaking this master's degree you will also acquire **solid knowledge of the functioning of securities markets and their products** (equities, fixed income, derivatives...), as well as the functioning of **crypto-assets**, both from a **financial and technological perspective**.

### b) Technical Profile

If you come from a technical background, computer scientist, engineer, mathematician, physicist, telecommunications engineer, **you will already have solid knowledge of programming and moderately advanced knowledge of Artificial Intelligence**.

This master's degree will allow you to acquire deep knowledge in technology law, delving into the legal requirements of technology, both from the perspective of the European Union, the United States, Asia and the Arab Emirates.

In addition, you will improve your knowledge of Artificial Intelligence, Cloud Services and Blockchain, and you will acquire advanced knowledge in financial markets and crypto-assets.

### c) Financial Profile

If you come from a financial background, investment fund manager, trader, chief investment officer, compliance department, or innovation applied to financial markets – you will already have **solid knowledge of the functioning of securities markets and their products**.

This master's degree will allow you to acquire deep knowledge in technology law, delving into the legal requirements of technology, both from the perspective of the European Union, the United States, Asia and the Arab Emirates.

In addition, it will allow you to acquire solid knowledge of AI, Cloud Services and Blockchain.

## Required Prior Knowledge

To enroll in this master's degree, participants **are not required to have a prior technical or conceptual foundation**, but a **commitment and a minimum dedication of 4 hours of study per day will be indispensable**.

**Throughout the program**, the student **will develop the skills and acquire the knowledge necessary** in Law and regulatory frameworks, but also training in programming, AI project management, Artificial Intelligence and machine learning (models, infrastructures, architectures and use cases), risk management, compliance, data governance, security fundamentals and vendor evaluation.

## In the master's degree not only Deep Learning is studied

There are five branches of Artificial Intelligence:

- Genetic Algorithms
- Swarm Algorithms
- Fuzzy Logic
- Machine Learning and Deep Learning
- Quantum Computing

The program of this master's degree is the only one in existence in which the five branches of knowledge of Artificial Intelligence are studied in depth, exploring each concept and explaining **what is currently being used** in the industry.

## Program Certified by Google

In this program, the student will be able to **obtain the most recognized certifications at the national and international level**.

A large part of the teaching staff of the **Artificial Intelligence module** will be composed of **Google engineers**. During this module, students will receive the necessary training to obtain the **Cloud Architect, Big Data Engineer and Machine Learning Engineer certifications**.

The examination will be taken through Google's own platform, the entity responsible for certifying the knowledge of the students.

## Employability and Talent Pool for Technology Law Firms

The profile of a technological lawyer is currently considered one of the most difficult positions for law firms to fill, and one of the best remunerated in the sector.

The level of demand of the master's degree, as well as the **constant updating of its content**, makes its graduates the **natural talent pool for any law firm**, whether it already has a **technology department** or is considering creating one.

The program has a direct connection with several law firms at both national and international level, as well as with the Madrid Bar Association. These institutions provide use cases for the master's thesis projects, which become employment opportunities for graduates.

Our objective is to **constantly seek collaborations with the leading law firms in order to achieve employability for our graduates close to 100%**.

## Academic Direction

Jesús Mardomingo



### Professional Experience:

Lawyer with over 35 years of professional experience and a renowned **partner in the Banking and Finance practice at Andersen, one of the world's largest law firms.**

His career has focused on providing legal advice to financial institutions, corporations, and public administrations, covering both public and private law, with specialization in commercial, corporate, and financial law.

From the beginning, he has been deeply involved in promoting the so-called "new economy," leading legal transformations arising from technological innovation and digitalization. **He has actively contributed to the creation of regulatory frameworks that drive technology, sustainability, and good corporate governance,** with a prominent presence in Ibero-America, particularly in sustainable finance and sovereign debt management projects. Notably, **he played a key role in the historic debt-for-nature swap in the Galápagos Islands, recognized by Forbes as a global example of legal and financial innovation.**

He combines his professional practice with a **strong academic vocation.** At the Instituto de Estudios Bursátiles (IEB), he has directed programs such as the Master's in Access to the Legal Profession, Financial Markets, Sustainability, and Innovation.

### Honors and Achievements:

He has been recognized in the leading international rankings, consolidating his position as **one of the world's foremost lawyers in financial regulation and fintech:**

- Chambers Global
- Legal 500
- IFLR1000
- Best Lawyers
- Expert Guides

Member of the Illustrious Bar Association of Madrid, he has chaired the **National Advisory Council of the Chartered Institute for Securities and Investment (CISI) for Spain and Latin America since 2022.**

His profile combines legal expertise, strategic vision, and technological acumen—a unique combination for leading a program that trains future legal professionals at the critical intersection of law and emerging technologies.

## Academic Direction

**Gloria Hernández Aler**



### Academic Background:

- Bachelor of Law from Complutense University of Madrid.
- **Master's in Securities & Financial Regulation** from Georgetown University, Washington DC, with a Fulbright scholarship.

### Professional Experience:

- Currently **Co-Founder and Partner at FinReg**.
- Former **Financial Sector Partner at DELOITTE**
- **Consultant at the INTER-AMERICAN DEVELOPMENT BANK**
- **Lawyer at CUATRECASAS**
- **Legal Counsel at the Madrid Stock Exchange, now BME SiX.**

### Honors and Achievements:

- **Member of the Advisory Committee of the CNMV**
- **Board member of the IEA and ASCOM.**
- Recognized as **one of the top financial law attorneys in Spain** by Chambers & Partners, Leaders League, and Best Lawyers, among others.

## Academic Direction

Gonzalo Navarro



### Academic Background

- **PhD in Law, Summa Cum Laude.** Thesis conducted in securities markets, "The Accounting Registry System of Securities Admitted to Trading" (Complutense University of Madrid).
- Executive MBA (IE Business School) and Program in AI and Blockchain (Stanford University).
- Master's Degree in Corporate Legal Advisory (IE Law School). Ranked **No.1 student of all graduating classes of 2010**.
- **Two simultaneous degrees:** Law and Business Administration and Management (Complutense University of Madrid).

### Professional Experience and Achievements

**Partner of Financial Regulation and Capital Markets at Crowe Spain**, where he advises all types of financial institutions, equity and debt securities issuers, and fintech and crypto service providers, among others. **Crowe Global is the eighth largest professional services firm in the world.**

Previously he joined the international law firm **ONTIER** as **Director of the Financial Regulatory Area**, focused on advising all types of regulated financial institutions, advising on digital assets (including tokenized financial instruments) and advising securities issuers in capital markets.

**Responsible for obtaining the authorization** from the Spanish National Securities Market Commission for a **new and pioneering fully digitalized securities market in Spain (Portfolio Stock Exchange)**, and for the securities firm that manages it, serving as **Legal and Compliance Director and Data Protection Officer** for three years for this entity.

He was part, for more than 9 years, of the **legal advisory department** of the Bolsas y Mercados Españoles Group (**BME Group**), a unique entity in Spain in the field of securities markets, since it brings together and manages all regulated markets and post-trading infrastructures in Spain, as well as the main Spanish multilateral trading systems.

Professional with **extensive experience in the areas of financial regulation, securities markets, regulatory compliance, technology contracting, data protection**, and in the application of new technologies such as **Blockchain and artificial intelligence**, having participated in relevant projects in these areas.

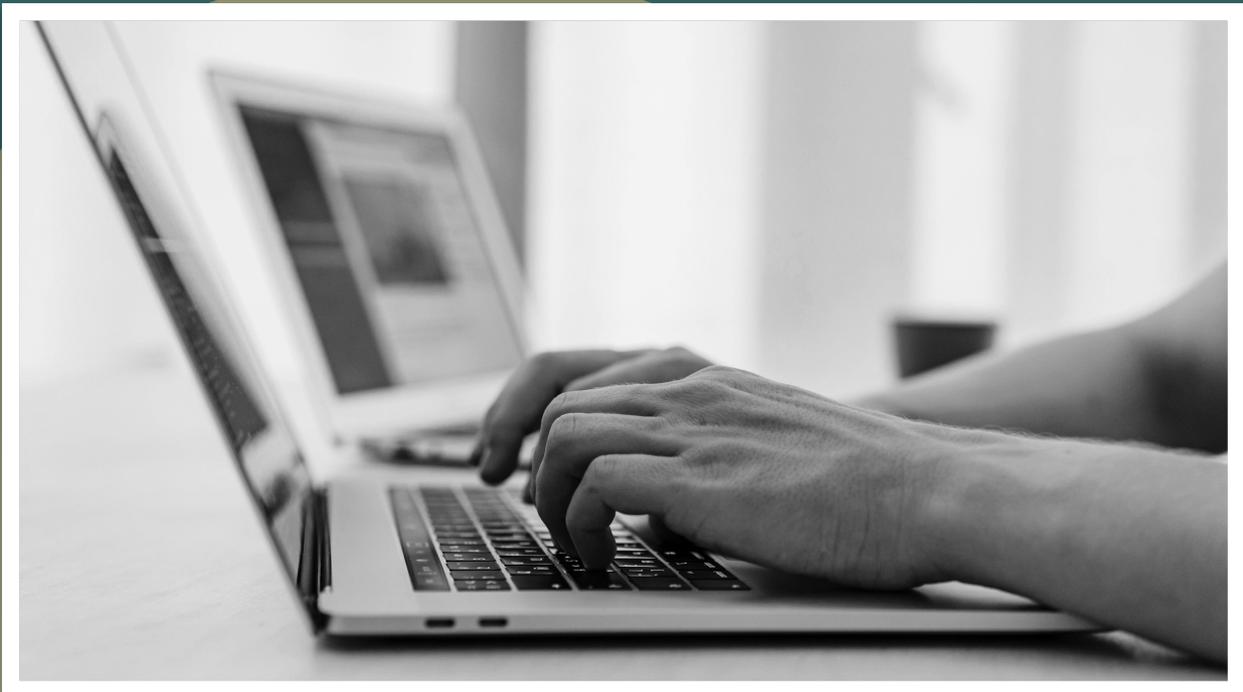
### Publications and Conferences

Regular speaker at conferences and specialized sector media in which he addresses topics related to securities markets, digital assets and financial regulation. Among his publications, the following stand out:

- NAVARRO RUIZ, G., "Securities Markets: Typology, Importance, Present and Future", (Dir. ORTEGA BURGOS, E., ASEGURADO, J.J.), AA.VV., Commercial Law Yearbook I: Corporate Law and Securities Market Law, 2026, Tirant lo Blanch, pp. 127–142.
- NAVARRO RUIZ, G., "Trading and Settlement of Crypto-Assets", (Dir. GARCÍA MEXÍA, P.), AA.VV., Journal of Privacy and Digital Law, January–March 2021, No. 21, pp. 65–98.
- NAVARRO RUIZ, G., "Application of Blockchain Technology to the Issuance of Tradable Securities", (Dir. GARCÍA MEXÍA, P.), AA.VV., Journal of Privacy and Digital Law, July–September 2019, No. 15, pp. 127–170.
- NAVARRO RUIZ, G., "The Accounting Registry System of Securities Admitted to Trading", Directed by TAPIA HERMIDA, A. and COLINO MEDIAVILLA, J.L., doctoral thesis, Complutense University of Madrid, 2017.

## Program Structure

*Every six months, we update the master's program content, ALWAYS offering truly cutting-edge material.*



## Full Program Structure

Modules	Teaching hours	Wt	Study hours	Total hours	ECTS
0. Introduction and TFM Sessions	30	3 %	60	90	3,6
1. Law Applied to Emerging Technologies	250	24 %	500	750	30
2. Risks, Governance, and Strategic Fundamentals	110	11 %	220	330	13,2
3. Financial Markets and Crypto Assets	65	6 %	130	195	7,8
4. Blockchain and Decentralized Market Infrastructure	40	4 %	80	120	4,8
5. Programming Fundamentals	30	3 %	60	90	3,6
6. Cloud Services and Big Data	180	17 %	360	540	21,6
7. Machine Learning and Deep Learning	105	10 %	210	315	12,6
8. Advanced and Generative Artificial Intelligence	130	13 %	260	390	15,6
9. Cybersecurity and Ethical Hacking	60	6 %	120	180	7,2
10. Quantum Computing	40	4 %	80	120	4,8
<b>Total</b>	<b>1.040</b>	<b>100 %</b>	<b>2.080</b>	<b>3.120</b>	<b>124,8</b>

## Structure of the ESSENTIAL Master's Program

Modules	Teaching hours	Wt	Study hours	Total hours	ECTS
0. Introduction and TFM Sessions	15	3 %	30	45	1,8
1. Law Applied to Emerging Technologies	250	56 %	500	750	30
2. Programming Fundamentals	30	7 %	60	90	3,6
3. Machine Learning and Deep Learning	85	19 %	170	255	10,2
4. Cloud Services and Big Data	70	16 %	140	210	8,4
<b>Total</b>	<b>450</b>	<b>100 %</b>	<b>900</b>	<b>1.350</b>	<b>54</b>

## Structure of the TOP Master's Program

Modules	Teaching hours	Wt	Study hours	Total hours	ECTS
0. Introduction and TFM Sessions	15	3 %	30	45	1,8
1. Risks, Governance, and Strategic Fundamentals	110	19 %	220	330	13,2
2. Financial Markets and Crypto Assets	65	11 %	130	195	7,8
3. Blockchain and Decentralized Market Infrastructure	40	7 %	80	120	4,8
4. Cloud Services and Big Data	110	19 %	220	330	13,2
5. Advanced and Generative Artificial Intelligence	150	25 %	300	450	18
6. Cybersecurity and Ethical Hacking	60	10 %	120	180	7,2
7. Quantum Computing	40	7 %	80	120	4,8
<b>Total</b>	<b>590</b>	<b>100 %</b>	<b>1.180</b>	<b>1.770</b>	<b>70,8</b>

# ESSENTIAL Program

## Module 1 | Law Applied to Emerging Technologies

250 Teaching hours

### ESSENTIAL Program Overview

- Presentation and Alignment of Objectives
- Emerging Technologies in Cybersecurity
- Business Case (Ensuring Consistency in Technological Application)

### Introduction to the Digital Regulatory Framework I

- General Principles of Regulation and Law
- Introduction to Financial Regulation

### Introduction to the Digital Regulatory Framework II

- Regulatory Logic and the Various Stakeholders
- Structure and Levels of Regulation and the Normative Hierarchy
- Regulation and Geopolitics: The EU and Other Major Regions

### Introduction to the Digital Regulatory Framework III

- The Role of National, European, and International Supervisory Authorities
- CNMV, Bank of Spain, EBA, SEPBLAC, AEPD, EBA
- Licensing, Registrations, and Notifications of Entities and Products
- Supervisory and Sanctions Regime

### Introduction to the Digital Regulatory Framework IV

- Overview of Financial Regulatory Sectors
- Banking, Securities, and Insurance and Their Variants in the Current Environment
- New Assets such as Cryptoassets and New Formats such as Tokenized Assets
- General Overview of Ongoing Regulatory Initiatives in Innovation, Sustainability, Technology, and Artificial Intelligence

### Law Applied to Insurance I

- Internet of Things (IoT) and Parametric Insurance
- Tokenization of Premiums and Coverage
- Use of Smart Contracts and Blockchain in the Automatic Execution of Claims

### Law Applied to Insurance II

- The Challenge of Cyber Insurance: Coverage, Legal Limits, and Emerging Risks
- Regtech and Insurtech: Regulatory Impact and Supervision by the DGSFP
- Ethics, AI, and Insurance: Algorithmic Bias, Duty of Disclosure, and Transparency

### Law Applied to Digital Banking I

- From Physical Banks to Digital Banks on the Smartphone
- Neobanks

### Law Applied to Digital Banking II

- From Current Accounts to Wallets
- Tokenized Deposits

### Law Applied to Digital Payments I

- Introduction to Money
- Types of Money
- Forms of Representation

### Law Applied to Digital Payments II

- Payment Ecosystem and Market Participants
- Instant Payments
- Open Banking and PSD2 / PSD3

### Law Applied to Digital Payments III

- The Bizum Case
- Invisible Payments

### Law Applied to Digital Payments IV

- Payments with Cryptocurrencies
- The Digital Euro

### Law Applied to Securities Markets I

- Regulatory Framework of Financial Markets
- Regulatory Authorities and Supervision at the European Level
- MiFID (Markets in Financial Instruments Directive)
- Market Abuse (Directive on Financial Instruments)
- Anti-Money Laundering and Counter-Terrorist Financing
- EMIR, REMIT, FATCA, CRS
- Criminal Liability of Legal Entities
- RDR (Retail Distribution Review)
- The Volcker Rule (Separation of Investment Banking and Commercial Banking Activities)
- SFT (Securities Financing Transactions)
- PRIIPs, PRIIPs, KIDs, and KIIDs

### Law Applied to Securities Markets II

- Regulation of Collective Investment
- UCITS Directive
- AIFMD (Alternative Investment Fund Managers Directive)
- EUSEF (European Social Entrepreneurship Funds) and EUVECA (European Venture Capital Funds)
- ELTIF (European Long-Term Investment Funds)
- Law 35/2003 on Collective Investment Schemes
- Law 22/2014 on Venture Capital and Collective Investment Entities and Management Companies

### Law Applied to Securities Markets III

- Pilot Regime Regulation
- Market Participants: Trading Venues, CCPs, Depositories, and Digital Custodians

### Law Applied to Securities Markets IV

- Interconnection Between Traditional Markets and DLT Markets
- Authorized Infrastructures to Date
- Supervision and Innovation: The Role of ESMA and CNMV in Tokenized Markets

### Regulation of Credit Institutions

- Justification for the Regulation of Financial

- Institutions
- Capital Requirements
  - Basel I
  - Basel II
  - Basel III
- Liquidity Requirements
- Banking Crisis Management Framework
- Banking Crises of 2023

#### **Law Applied to Crypto-Asset Services and Markets I**

- Overview of Crypto-Asset Markets
- Crypto-Asset Service Providers: Licensing, Obligations, and Oversight

#### **Law Applied to Crypto-Asset Services and Markets II**

- Market Abuse and Crypto-Assets
- AML and Crypto-Assets

#### **Law Applied to Crypto-Assets and Decentralized Technologies I**

- An Introduction to MiCA
- Legal Aspects of Smart Contracts: Essential Elements of a Contract, Formalities
- Signature, Party Identification, Applicable Law
- Interpretation of Smart Contracts
- Governance Models
- Onboarding Systems in DLT. Parties' Obligations
- Sanctioning Regimes
- European Regulation on Market Infrastructures Based on Distributed Ledger Technology

#### **Law Applied to Crypto-Assets and Decentralized Technologies II**

- Legal Aspects of Smart Contracts
- Sandbox and Positions of CNMV / Bank of Spain / Comparative Law
- Legality of Exchanges
- Compliance
- Regulatory Challenges and Traceability
- Tax Regulation
- Cointracking

#### **Law Applied to Platform and Distributed Services I**

- Cloud Services and Data Security
- Types of Cloud Computing Services
  - Building Services from the Cloud: The Use Case of Trust Service Providers (eIDAS2 Regulation)
- Regulatory and Contractual Aspects of Cloud Storage
  - Terms and Conditions: Applicable Versioning
  - Standards and Verification
  - Multi-Jurisdictionality and Data Protection: Virtualization
  - Data Protection in the Cloud
  - Cybersecurity

#### **Law Applied to Platform and Distributed Services II: DSA**

- Scope of Application
- Intermediary Liability Exemptions: Good Samaritan Clause
- Due Diligence Obligations
  - Universal
  - For All Hosting Services, Including Online Platforms
  - Additional for Online Platform Providers
  - Special and Additional for Very Large Online

#### **Platforms (VLOPs) and Very Large Search Engines (VLSEs)**

- Annual Systemic Risk Assessment
- Specific Risk Mitigation Measures
- Crisis Response Mechanisms
- Recommendation Systems
- Additional Transparency in Online Advertising
- Data Access
- Monitoring and Compliance Functions
- Independent Audit
- Transparency Reports
- Additional Provisions for Online Platforms Enabling Consumer Distance Contracts
- Enforcement, Competent Authorities, and Sanctions

#### **Law Applied to Platform and Distributed Services III: DMA**

- Context
- Definition of Core Platform Services
- Gatekeepers: Who They Are
- Gatekeepers' Obligations and Prohibitions
  - Competition
  - Data Processing
  - Transparency and Audit: Profiling Practices
  - Transparency Obligations: The Case of Advertising
- Sanctions for Non-Compliance

#### **Law Applied to DLT, Ledgers, and Blockchain I**

- Introduction to Blockchain Technology as a Distributed Ledger Technology (DLT) System
- Actors and Components
- Types of Networks: Private, Public, and Permissioned
- Consensus Models

#### **Law Applied to DLT, Ledgers, and Blockchain II: Tokenization and Types of Crypto-Assets**

- An Introduction to MiCA
- New Forms of Providing Crypto-Asset Services: Decentralized Autonomous Organizations (DAOs) and Decentralized Finance (DeFi)
- Non-Fungible Tokens (NFTs)

#### **Law Applied to DLT, Ledgers, and Blockchain III: Registration and Smart Contracts**

- Legal Aspects of Smart Contracts: Essential Contractual Elements and Formalities
- Signature, Party Identification, Applicable Law
- Interpretation of Smart Contracts
- Smart Contracts and Technological Failures

#### **Law Applied to DLT, Ledgers, and Blockchain IV: Governance Models**

- Onboarding Systems in DLT. Parties' Obligations
- Sanctioning Regimes
- Governance Types in Public, Private, and Permissioned Networks
- Legal Systems: eIDAS and eIDAS II Regulations

#### **Law Applied to DLT, Ledgers, and Blockchain V**

- Application of Blockchain Technology to Traditional Business Models, with Special Focus on the Financial Sector
- European Regulation on Market Infrastructures Based on Distributed Ledger Technology
- SSI and Digital Identity

- Non-Fungible Tokens (NFTs)
- Intellectual Property Priority Rights
- Customer Data Exchange under the Data Act
- Creation of a Cryptocurrency

#### **Law Applied to Digital Transformation and Sustainability I**

- Relationship Between Fintech and Sustainability, and Areas of Collaboration
- Sustainable Finance: Theoretical Perspective and Practical Examples
- EU Sustainable Finance Action Plan: Regulatory Background and Context
- Regulatory Initiatives Derived from the Action Plan
- The Banking Sector's Commitment Beyond Regulation
- Application of Machine Learning in the Financial Sector
- Artificial Intelligence (AI) and Big Data Analytics
- Crowdfunding and Participatory Financing Platforms

#### **Law Applied to Digital Transformation and Sustainability II**

- Development of Fintech Firms Based on ESG Criteria and Consumer-Oriented Business Models
- Investment Advice (Robo-Advisory), Credit Decisions, Asset Trading
- Digital Currencies, Automated Transactions, Payment Settlement, Crowdfunding
- Peer-to-Peer (P2P) Transactions and Mobile Wallets
- Implementation of Platforms, Digital Banking, and Branchless Models
- Recovery Plan: Digitalization and Green Transition
- Lighthouse

#### **Law Applied to Digital Transformation and Sustainability III: Blockchain Technology in the Financial Sector and ESG Aspects**

- Green Finance, Risk Management, and Reporting
- Carbon Credits
- Accounting and Reporting of Greenhouse Gas (GHG) Impact
- Eco-Certification of Non-Fungible Tokens (NFTs)
- Tokenized Incentives and Rewards
- Decentralized Autonomous Organizations (DAOs)

#### **Law Applied to Digital Transformation and Sustainability IV**

- Case Study: Appraisal Companies or Financial Institutions
- The Digital Euro

#### **Law Applied to Digital Identity I: Identity Systems**

- Centralized
- Federated
- Decentralized: SSI, DIDs, and ESSIF

#### **Law Applied to Digital Identity II: Identity and Means of Identification under the eIDAS Regulation**

- What is Identity?
- Presumed Identity and Risk Analysis: Zero Trust vs. Friction
- Differences Between Identity, Identification, Identity Verification, and Authentication
  - PSD2, EBA, and Authentication Factors
- Identity Model under the eIDAS1 Regulation
  - National Identity Documents: Analog and Digital
  - Signature Certificates: Types of Signatures and Their Evidentiary Value in Identity

#### **Law Applied to Digital Identity III: The Verification Process and Its Five Stages – In-Person and Online**

- Applicable Regulations: Spain and EU
- Applicable Standards: Spain and EU
- Service Delivery Models:
  - In-Person and Online
  - Assisted, Unassisted, or Hybrid
  - Biometric Recognition and Verification Tools in Identity Verification Processes
- Cybersecurity in Identity Verification Processes
- Anti-Spoofing Measures, Liveness Detection, Attack Types, and Countermeasures

#### **Law Applied to Digital Identity IV: The Identity Model under the eIDAS Regulation**

- The EDIW (European Digital Identity Wallet)
  - Regulation
  - Functioning
  - Interoperability with Trusted Third Parties
  - Wallet Security
- Attribute Attestations: Differences and Commonalities with Verifiable Credentials in Other Models
  - Trusted Attribute Attestation Service Providers
  - Regulation and Functioning
  - Similarities and Differences with Qualified Certificate Issuers and SSI/DID Models
  - Interactions with Other Providers/Operators
- Attribute Attestation Formats
- Interoperability
- Trust Services and Their Providers After the Reform: What Changes and What Remains
- Cybersecurity Requirements: The New Framework and Standards

#### **Law Applied to Artificial Intelligence Systems I**

- Big Data Processing Models
- Types of AI and Common Algorithms
  - Artificial Intelligence Regulation
  - Tools by Risk Level
  - Transparency Obligations
  - Audit and Compliance
  - Data Protection Aspects

#### **Law Applied to Artificial Intelligence Systems II**

- Use of AI Systems for Decision-Making in the Financial Sector
- GPT-3.5/4 in the Legal Field
- The Decline of LegalTech

#### **Law Applied to Artificial Intelligence Systems III**

- Automation and Taxation
- The Operator/Producer Figures and Their Legal Implications
- Autonomous Learning Systems and Cases of Online and Offline Learning

#### **Law Applied to Artificial Intelligence Systems IV**

- Legal Frameworks for Artificial Intelligence in Europe, the US, Asia, and the Middle East
- Liability Associated with Artificial Intelligence Systems (I)
- The Operator/Producer Figures and Their Legal Implications

- Autonomous Learning Systems and Cases of Online and Offline Learning

#### **Law Applied to Artificial Intelligence Systems V**

- Liability Associated with Artificial Intelligence Systems (II)
- The New Artificial Intelligence Regulation
  - Legal Framework for Advisory Services / Investment Algorithms / MiFID II
  - Requirements for High- and Low-Frequency Trading Algorithms
  - Traceability and Associated Responsibilities
- Data Protection
- Case Studies on Liability in the Use of AI

#### **Law Applied to Artificial Intelligence Systems VI**

- The Importance of Ethics in AI Regulation
- Personal Data Protection Regulations in AI Systems
- The Artificial Intelligence Sandbox
- The Spanish AI Supervisory Agency
- Malfunctioning vs. "Past Performance Does Not Guarantee Future Returns"

#### **Law Applied to Artificial Intelligence Systems VII**

- Open AI
- Types of Licenses for AI Components
- Model Cards
- Intellectual Property Rights and Their Role
- Impact of Regulation on Models
- Case Studies

#### **Law Applied to Trust Service Providers I**

- Electronic Signature: Definition and Properties. Types (Advanced, Probabilistic, Blind, Multiple, Delegated, etc.)
- Document Signing: Creation and Verification of an Electronic Signature
- Standard Signature Algorithms: RSA, DSA, ECDSA
- CAAdES, PAdES, and XAdES Signatures

#### **Law Applied to Trust Service Providers II**

- Electronic Certificates (With/Without Private Key). Certification Authorities and Relational Structures
- Certificate Revocation
- Time Stamps. Time-Stamping Authorities. Requirements
- Trust Service Providers
- Vulnerabilities and Risk Assessment

#### **Law Applied to Cryptography I**

- Cryptography and Cryptanalysis
- Basic Binary Arithmetic: Number Size and Bitwise Operations
- Algorithms and Computational Complexity (Execution Times)
- Basic Mathematical Tools: Modular Arithmetic and Elliptic Curves
- Mathematical Problems Underlying Cryptographic Security: Primality, Factorization, and Discrete Logarithm

#### **Law Applied to Cryptography II**

- Random Number Generators (RNGs): Truly Random (TRNG) and Pseudorandom (PRNG)
- Metrics and Standards. Key Generation
- Symmetric-Key Cryptography: DES, 3DES, and AES

- Hash Functions: MD, SHA
- Key Exchange Protocols: DH and ECDH
- Public-Key Cryptography:
  - RSA: Primality and Factorization
  - ElGamal: Discrete Logarithm
  - ECC: Elliptic Curves and Elliptic Logarithm
- Algebraic and Physical Security
- Recommended and Legacy Algorithms (SOG-IS, CCN)
- Current Security and Quantum Computing

#### **Law Applied to Cybersecurity I**

- Security vs. Security Management. The ISO/IEC 27001 Model
- From Physical Security to Logical Security: Integrated Security in a Connected World. Cybersecurity
- Risk Analysis
- Common Attack Vectors and Threats (APTs, Ransomware, Cyberattacks – DoS, etc.)
- Application of Controls for Risk Mitigation
- Special Reference to Supply Chain Security
- Penetration Testing

#### **Law Applied to Cybersecurity II: Cybersecurity Regulations and Competent Authorities**

- Critical Infrastructures
- NIS1 and NIS2
- Cybersecurity Act
- Connection with Criminal Codes

## **Module 2 | Programming Fundamentals**

30 Teaching hours

#### **Python Programming Fundamentals I**

- Installation
- Jupyter Notebooks
- Basic Syntax, Operations, and Core Data Types
- Strings
- Data Structures: Lists, Tuples, Sets, and Dictionaries

#### **Python Programming Fundamentals II**

- Control Flow
- Dict and List Comprehensions
- Exceptions
- Functions
- Modules and Scripts
- Writing Text Files and Saving Variables

#### **Python Programming Fundamentals III**

- Numpy Library

#### **Python Programming Fundamentals IV**

- Pandas Library

#### **Python Programming Fundamentals V**

- Data Visualization with Matplotlib
- Data Visualization with Pandas
- Data Visualization with Seaborn
- Financial Data Visualization
- Interactive Visualization with ipywidgets
- Data Acquisition and Storage

#### **Python Programming Fundamentals VI**

- Object-Oriented Programming

- Inheritance
- Decorators
- Introduction to HTML
- Web Scraping

## Module 3 | Machine Learning and Deep Learning

85 Teaching hours

### Machine Learning I

- Introduction to Machine Learning
  - AI vs. ML
  - Supervised vs. Unsupervised Learning
  - Classification vs. Regression
  - Parametric vs. Non-Parametric Models
  - Linear vs. Nonlinear Models
- Examples of Financial Applications Using ML
- K-Nearest Neighbors (KNN)
- Decision Trees
  - Simple Decision Tree Example
  - Explainable AI (XAI) for Trees

### Machine Learning II

- Preprocessing and Evaluation Metrics
  - Normalization and Standardization
  - Encoding, Labeling, and Discretization (Dummies)
  - Missing Values, Outliers, and NaNs
  - Approaching Time Series as Sequence Blocks
  - Evaluation Metrics: Confusion Matrix, Precision, Recall
  - Simple and Cross Validation
- Dimensionality Reduction
  - The Curse of Dimensionality
  - Feature Selection and Principal Component Analysis (PCA) and Linear Discriminant Analysis (LDA)

### Machine Learning III

- More Complex Classification Models
- Bayesian Theory: Naive Bayes
- Ensemble Classifiers: Bagging, Boosting, Random Forest, and Gradient Boosting
- Support Vector Machines (SVMs)

### Machine Learning IV

- Agglomerative Hierarchical Clustering
  - Definition (Linkage Types)
  - Manual Implementation
  - Simple Example
- Centroid-Based Clustering: K-Means and K-Medoids
  - Definition and Manual Implementation
  - Simple Example with K-Means
  - Interpreting Centroids as Representatives
- Gaussian-Based Clustering: Expectation-Maximization (EM)
  - Definition (Generalization of K-Means)
- Density-Based Clustering: DBSCAN
  - Definition and Simple Example
- Comparison of Clustering Algorithms
  - Comparison Metrics
  - Selection of Appropriate Clustering Algorithm
  - Comparison Examples

- Asset Clustering Using Correlations and Momentum

### Machine Learning V – Practical Case

- Feature Generation
- Extraction of Relevant Attributes
- Dimensionality Reduction Incorporating XAI
- Clustering
- Graphext (No-Code Data Analysis)
- XAI for Obtained Results

### Dense Neural Networks I

- Introduction
- Working Environment
- Basic Concepts
- Linear Regression
- Gradient Descent
- Logistic Regression
- Nonlinear Models

### Dense Neural Networks II

- Introduction to Neural Networks
- Feedforward Neural Networks
- Implementing a Neural Network (Forward Pass)
- Chain Rule for Derivatives
- Backpropagation

### Dense Neural Networks III

- Implementing a Neural Network (Backward Pass)
- Introduction to Keras and PyTorch
- Automatic Differentiation

### Dense Neural Networks IV

- Implementing a Neural Network with Keras and PyTorch
- Training a Neural Network
- Stochastic Gradient Descent
- Cost Function
- Activation Function

### Dense Neural Networks V

- Regularization
- Weight Initialization
- Batch Normalization
- Other Optimization Techniques
- Second-Order Methods

### Dense Neural Networks VI

- Hyperparameter Optimization
- Evaluation Metrics
- Cross-Validation
- Grid Search
- Keras Tuner
- HParams Dashboard

### Convolutional Neural Networks I

- Kernel Size
- Stride and Padding
- Max Pooling
- Number of Filters and Features
- Dropout

### Convolutional Neural Networks II

- Building in Keras
- Kernel Optimization
- Stride and Padding Optimization
- Max Pooling

- Optimization of Filters and Features
- Dropout
- 1D, 2D, 3D Networks

#### **Convolutional Neural Networks III**

- Distance Measures Between Images
- Siamese Networks and Content-Based Image Retrieval (CBIR)
- Learning Representations with CNNs
- Applications in Image Search
- Network Robustness
- Adversarial Examples

#### **Convolutional Neural Networks IV**

- Input Perturbation Attacks: One-Pixel Attack
- Adversarial Training Methods: Differential Evolution (DE)
- Applications in Generating Robust Models
- YOLO Networks
- RAM (Recognize Anything)

#### **Recurrent Neural Networks I**

- Memory-Based Networks
- Long-Term Dependency Problem
- LSTM Networks in TensorFlow and Keras
- LSTM Variants

#### **Recurrent Neural Networks II**

- Truncated Backpropagation
- Accumulating LSTM
- Bidirectional LSTM
- Forecasting with LSTM: Time Series, Sequences, and Predictions

## **Module 4 | Cloud Services and Big Data**

70 Teaching hours

#### **Google Cloud I. Cloud Basics**

- IAM, Console
- Cloud shell
- Authentication, permissions

#### **Google Cloud II. Compute**

- Compute Engine
- App Engine
- Cloud GPU
- Spot VMs
- Bare Metal
- Disks

#### **Google Cloud III. Storage. Databases**

- AlloyDB for PostgreSQL
- Cloud SQL
- Firestore
- Spanner
- Memorystore

#### **Google Cloud IV. Kubernetes I**

- Google Kubernetes Engine
- Artifact Registry
- Cloud Build

#### **Google Cloud V. Kubernetes II**

- Migrate to Containers
- Knative
- Deep learning Containers

#### **Google Cloud VI. Security and Identity**

- Sensitive Data protection
- Google Threat Intelligence
- Security Command Center
- Assured workloads

#### **Google Cloud VII. Networking**

- Cloud CDN
- Load balancing
- Cloud NAT
- Virtual Private Cloud
- Private Service Connect

#### **Google Cloud VIII. Developer Tools**

- Cloud Workstations
- Cloud SDK
- Cloud Code
- Cloud Deploy

#### **Google Cloud IX. Serverless**

- Cloud Run
- Cloud Functions
- Workflows
- API Gateway

#### **Google Cloud X. Operations**

- Cloud Logging
- Cloud monitoring
- Error reporting
- Cloud Trace
- Cloud Profiler

#### **Preparation for the Professional Cloud Architect Certification**

##### **CI/CD I**

- Introduction and Advanced Git Configuration
- Advanced Branch Management, Merges, and Conflict Resolution
- Collaboration on GitHub: Pull Requests, Code Review, Actions
- Collaborative Project Using Git and GitHub (Full Workflow)
- Feedback and Evaluation of Collaborative Project

##### **Advanced Visualization Techniques**

- Introduction to HTML
- Introduction to CSS
- Introduction to Flask
- Interactive Interfaces with Dash

#### **Professional Cloud Architect Certification Exam**

##### **Master's Thesis Defense I**

##### **Master's Thesis Defense II**

# TOP Program

## Module 1 | Risks, Governance, and Strategic Fundamentals

110 Teaching hours

### Program Overview

- Presentation and Alignment of Objectives
- Emerging Technologies in Cybersecurity
- Business Case Analysis (Ensuring Coherence in Technological Application)

### Evolution of AI and Its Impact on Business

- Main Stages: Symbolic AI, Machine Learning, Deep Learning, Generative AI
- Representative Use Cases for Each Stage
- Effects on Efficiency, Productivity, and Business Models
- Organizational Changes Driven by AI
- New Risks and Challenges: Ethical, Regulatory, and Technological

### AI Project Management

- When to Apply Machine Learning and Problems to Address
- Production Software
- Infrastructure
- Best Practices in Development and Deployment
- Tools

### Applied Ethics and Responsible AI Principles

- Core Principles: Transparency, Fairness, Non-Maleficence, Accountability
- Social and Ethical Impact Assessment of AI Systems
- Mitigation of Algorithmic Bias and Discrimination
- Regulatory and Normative Frameworks (EU, UNESCO, OECD)
- Integration of Ethics into the AI Development Lifecycle

### International Regulatory Frameworks

- EU AI Act: Risk Categories and Obligations
- Relevant ISO Standards: ISO 23894 (Risk Management), ISO 42001 (AI Management System), ISO 22989 (Terminology), etc.
- OECD Principles and UNESCO Guidelines on Responsible AI
- Comparative Approaches: EU, US, China, and Other Regions
- Global Trends Toward Algorithmic Governance and Regulatory Interoperability

### Introduction to ISO Standards I

- ISO 22989: Fundamental Terminology for AI Systems and Their Environment
- ISO 23894: Risk Management Specific to AI Systems
- ISO 42001: AI Lifecycle Management System (AI Management System)
- ISO 38507: AI Governance in Corporate Governance Context (Complementing ISO 38500)
- ISO 31000: General Risk Management Framework, Applicable to AI Projects

### Introduction to ISO Standards II – AI Management System (ISO/IEC 42001)

- Organizational Context (Understanding Organizations, Third Parties, and AI Management Systems)
- Leadership
- Policies
- Roles and Responsibilities
- Planning (Assessment, Treatment, and Impact)
- Support (Resources, Risks, Communication, Documentation)
- Operations (Risk Assessment and Treatment)
- Improvement

### Introduction to ISO Standards III – Governance of Disruptive Technologies (ISO/IEC 38507)

- Scope
- Terms and Definitions
- Implications for Organizational AI Governance
- Overview of AI and AI Systems
- Policies to Address AI Use
- Governance and Organizational Decision-Making

### Introduction to ISO Standards IV – Risk Management in AI Systems (ISO/IEC 23894 and 31000)

- Design, Implementation, and Evaluation
- Overall Risk Assessment and Monitoring Process
- Reporting Process
- Objectives
- AI Lifecycle

### Certificación ISO - AI Management Leader (ISO/IEC 42001)

### Certificación ISO - AI Governance Leader (ISO/IEC 38507)

### AI Cybersecurity

- Technical Security Measures
- Adversarial Attacks & One-Pixel Attack
- Data Poisoning
- Prompt Injection
- Defense and Resilience

### Model Risks in Integrating AI into Current Technology Infrastructures

- Bias Risk
- Opacity Risk (Black Box), Explainability, and Reproducibility
- Robustness Risk
- Model Drift
- Purpose Limitation
- Improper Output Handling
- Excessive Agency
- System Prompt Leakage
- Vector & Embedding Weaknesses
- Unbounded Consumption

- Third-Party Dependency

#### **AI-Related Risks, Monitoring, and Oversight I**

- Model Risk
- Operational Risks

#### **AI-Related Risks, Monitoring, and Oversight II**

- Compliance Risk
- Legal Risks
- Ethical Risks

#### **Challenges and Considerations in AI Risk Management Implementation**

- Data Quality and Availability
- Model Risk (Including Explainability and Transparency)
- Algorithmic and Fairness Bias
- Regulatory Compliance
- Data Security and Privacy
- Third-Party Dependency (Vendors)
- Shortage of Specialized Talent
- Implementation Costs
- Innovation Pace vs Oversight Capacity

#### **Key Roles and Relationships in Organizations and with the CAIO**

- CISO (Chief Information Security Officer)
- DPO (Data Protection Officer)
- CTO (Chief Technology Officer)
- CIO (Chief Information Officer)
- CRO (Chief Risk Officer)

#### **Vendor Management and Evaluation I**

- AI Third-Party Risk Management (TPRM) Framework
- Vendor Approval, Assessment, and Monitoring Criteria
- Shared Governance and Quality Control Frameworks

#### **Vendor Management and Evaluation II**

- Traceability, Security, and Performance Metrics
- Continuous Oversight
- Incident Response

#### **Data Governance I**

- Strategic Role of the CDO in AI
- Data Governance: Quality and Sustainability

#### **Data Governance II**

- Legal and Regulatory Framework
- GDPR
- Privacy Principles
- Digital Rights

#### **Data Governance III**

- Advanced Data Protection Techniques: Anonymization, Pseudonymization, Federated Learning, Differential Privacy
- Coordination between DPO, CISO, and CAIO
- Transparency, Trust, and Stakeholder Communication

#### **AI GRC Tools**

- Inventory and Classification of AI Systems
- Risk and Control Catalog
- Monitoring of Projects, Use Cases, and Dashboards
- System Evaluation Based on Regulation
- Workflow Management

## **Module 2 | Financial Markets and Crypto Assets**

65 Teaching hours

### **Equity Markets**

- Functions of the Stock Exchange
- Distinction between Primary and Secondary Markets
- Types of Corporate Actions: Takeover Bids (Tender Offers), Initial Public Offerings (IPOs), Capital Increases, Stock Splits and Reverse Splits
- Operation of the Spanish Continuous Market (SIBE)
  - Market Phases
  - Block Trades and Special Transactions
  - Auctions vs. Open Market
  - Trading Rules
  - Types of Orders
  - Volatility Auctions: Static and Dynamic Ranges
- Organized Markets vs. OTC (Over-the-Counter)
- Clearing House

### **Equity and Index Futures**

- Forward Price of an Asset
- Concept of Basis and Open Interest
- Futures in Contango and Backwardation
- Futures Pricing and Implied Rates
- Futures Pricing on an Index and the Conversion of Dividends into Index Points
- Speculation and Leverage
- Hedging with Futures on Individual Stocks: Total and Partial Hedging
- Hedging with Index Futures
- Hedging Risks
- Arbitrage Strategies: Cash & Carry and Reverse Cash & Carry
- Time Spreads: Rollover Effect in Contango and Backwardation

### **Equity Options**

- Types: American and European Options
- Intrinsic Value and Time Value
- Classification: In the Money (ITM), At the Money (ATM), Out of the Money (OTM)
- Key Pricing Parameters: Underlying Asset, Strike Price, Dividends, Time to Maturity, Interest Rates
- Asset Replication
- Arbitrage with Options
- Conversion and Reversal Strategies
- Risk Factors
- Put-Call Parity Theory: Formulations and Types of Options
- The Greeks and Sensitivity Management: Delta, Gamma, Vega, Theta, Rho
- Static Hedging Strategies
  - Options Structures: Calls, Puts, Spreads, and Tunnels
  - Selection of Strike Prices and Expiration Dates
  - Risk Profile Analysis and Synthetic Adjustments
  - Combined Strategies:
    - Directional

- Volatility-based
- Mixed
- Volatility Trading: Delta-Neutral Strategies and Gamma Scalping

#### Foreign Exchange (FX) Markets

- Factors Affecting Exchange Rates
- Spot FX and Cross Rates
- Market Conventions
- Forward Exchange Rate (Implied Interest Rates)
- Currency Futures
- Forward Price: Swap Points
- FX Forwards and Hedging Instruments
- Currency Options
- Delta Hedging
- Volatility Surface
  - Risk Reversal Strategies
  - Volatility Skew
  - FX Contract Characteristics

#### Fixed Income Markets

- Bond Pricing
- Mathematical Foundations: Capitalization, Discounting, and Time Value of Money
- Interest Rates: Euribor / Eonia / EuroSTR
- Zero-Coupon Yield Curve: Methodologies and Constraints in Its Construction
- Bonds and Floating Rate Notes (FRNs)
- Valuation Metrics: Duration, Sensitivity, Convexity
- Fixed Income Instruments and Trading Practices
- Fixed Income Derivatives: Bond Futures and Euribor Futures

#### Commodities

- Classification, Markets, and Instruments
- Price Formation, Volatility, and Correlation
- Contango and Backwardation in Commodities
- Base Metals: Aluminum, Copper, Zinc, Nickel, Lead, Tin
- Energy and Emissions: Oil, CO<sub>2</sub>
- Precious Metals: Gold, Silver, Platinum, Palladium
- Other Commodities: Plastics, Coal, Agricultural Products, Paper

#### Modern Portfolio Theory and Beyond I

- Fama and French Three-Factor Model
- Impact of Covariance Matrix Structure
- Portfolio Weight Allocation
- Industry Benchmark: 60/40 Portfolio
- Covariance Matrix Adjustments

#### Modern Portfolio Theory and Beyond II

- Risk Parity
- Hierarchical Risk Parity
- Inverse Volatility Strategies
- Kalman Filter Applications
- Kelly Criterion
- Portfolio Management Workshop

#### Cryptoassets I

- Fundamentals of Cryptoassets
- Major Cryptoassets
  - Bitcoin: Use and Adoption

- Ethereum: Smart Contracts and ERC-20/721 Tokens
- Other Relevant Assets: Litecoin, Ripple (XRP), Cardano, Solana, TON, Avalanche
- Memecoins (Community Concept)
- Stablecoins: Definition, Types (Collateralized, Algorithmic), and Use Cases
  - Key Stablecoins: USDC, USDT, DAI
- Platforms and Basic Tools:
  - CoinMarketCap, CoinGecko, Messari
  - Centralized Exchanges (Binance, Kraken) vs. Decentralized Exchanges (Uniswap, PancakeSwap)
  - Security: Custodial vs. Non-Custodial Wallets (e.g., Argent, Cripitan)
- Market Landscape: Institutional Players, Fintechs

#### Cryptoassets II

- Cryptoasset Markets
  - Spot Trading: Basic Functioning
  - Margin Trading: Leverage and Risks
  - Derivatives: Futures, Options, and Perpetual Contracts
- Financial Instruments in Crypto:
  - Cryptocurrency CFDs
  - Crypto-based ETFs and Funds
- Risk Management Principles
  - Cryptoasset Volatility
  - Stop-Loss, Take-Profit, and Hedging Strategies

#### Cryptoassets III

- Introduction to DeFi (Decentralized Finance): Definition and Operation
  - Key Protocols: Aave, Compound, MakerDAO
- DeFi Products and Strategies:
  - Staking: Proof of Stake (PoS), Lido
  - Decentralized Lending and Borrowing
  - Institutional Lending
  - Yield Farming: Liquidity Pools and Rewards
- Interoperability and Blockchain Bridges:
  - How Cross-Chain Bridges Operate
  - Key Projects: Polkadot, Cosmos
- Risks and Opportunities in DeFi:
  - Smart Contract Security
  - Rug Pulls and Flash Loan Attacks

#### Cryptoassets IV

- Crypto Mining:
  - Proof of Work (PoW) vs. Proof of Stake (PoS)
  - Cloud Mining and Mining Pools
- Staking as an Alternative
  - Emerging Business Models
- Trends and Regulation:
  - Central Bank Digital Currencies (CBDCs)
  - International Regulation and Market Implications
- DeFi and Real-World Assets (RWA)
- Case Studies of Crypto Adoption:
  - El Salvador
  - Global Corporations
- Current Market Analysis and Future Outlook

**Cryptoassets V**

- Fintech and Open Banking
- Digital Assets and the Token Economy
- DeFi and Tokenization
- Building a Digital Asset Platform: Renta 4 (Case Study of Success)

**Module 3 | Blockchain and Decentralized Market Infrastructure**

40 Teaching hours

**Blockchain Fundamentals**

- Bitcoin
  - The Double-Spending Problem
  - Bitcoin and Blockchain Technology
  - Economic Aspects and Technical Keys
  - Hash Function and Asymmetric Cryptography
  - Keys, Addresses, and Wallets
  - Transactions, Blockchains, and Consensus
  - Lightning Network
- Ethereum
  - Technical Foundations
  - Wallets and Transactions
  - Solidity, Vyper
  - Consensus and Tokens
  - DeFi, Uniswap, Compound, NFTs, DAOs

**Smart Contract Programming on Ethereum I**

- The Solidity Language
- Structure of a Solidity Source File
- Remix: Development, Deployment, and Interaction
- Structure of a Contract
- Data Types
- Units and Globally Available Variables

**Smart Contract Programming on Ethereum II**

- Control Structures
- Error Handling
- Inheritance
- Interfaces
- Assembly
- Advanced Concepts
- Debugging and Unit Testing in Remix

**Smart Contract Programming on Ethereum III**

- ERC20 and ERC721 Token Standards
- Practical Case 1: Bank
- Practical Case 2: Room Reservation
- Practical Case 3: Auction
- Withdraw and Owner Design Patterns
- Smart Contract Security
  - Reentrancy
  - Overflow
  - Denial of Service
  - Code and Security Analysis Tools

**Smart Contract Programming on Ethereum IV**

- Design Patterns in Solidity
  - Proxy Pattern
  - Smart Contract Upgrade Pattern

- Diamond Pattern
- Vyper and Other Ethereum Programming Languages
  - Principles and Objectives
  - Vyper vs Solidity
  - Writing a Contract in Vyper
  - Compilation and Deployment
  - Other Alternatives: Yul, Yul+, Fe

**Smart Contract Programming on Ethereum V**

- Development Tools:
  - Truffle
  - Ganache
  - MetaMask
- Solidity for Application-Oriented Development: Backend
  - Java
  - JavaScript
- Solidity for Application-Oriented Development: Frontend
  - Graphical Interface Integration
  - Connection with MetaMask

**Utilities for Decentralized Applications I**

- Practical Case: dApp with a Voting System for Members
- Blockchain Oracles
  - What They Are and Why They Are Needed
  - Different Architectures and Designs
  - Provable & Chainlink
  - Practical Cases
- Decentralized Storage
  - IPFS, Swarm
  - Practical Case

**Utilities for Decentralized Applications II**

- Digital Identity
  - Definition and Non-Blockchain Applications
  - OpenID, Electronic Voting
- Digital Identity on Blockchain
  - Standards and Implementation
  - Decentralized Governance

**Module 4 | Cloud Services and Big Data**

110 Teaching hours

**Big Data and Data Processing I**

- Analítica de datos: visión end-to-end de todos los servicios
  - Collect: Pub/sub, VerneMQ
  - Process: dataflow, Dataproc (spark)
  - Store: GCS, BigQuery, BigQuery ML, BigTable
  - Analyze: BigQuery SQL, Dataproc (spark)

**Big Data and Data Processing II. Collect I**

- Google Cloud Pub/sub
- Messages, Topics
- Best practices
- VerneMQ
- Apache Kafka

**Big Data and Data Processing III. Process I**

- Dataflow
- Templates
- I/O connectors best practices
- Dataflow runner

**Big Data and Data Processing IV. Process II**

- Dataproc (spark)
- Dataproc serverless
- Clusters
- Troubleshooting

**Big Data and Data Processing V. Store I**

- Google Cloud Storage
- BigQuery
- BigTable

**Big Data and Data Processing VI. Analyze I**

- BigQuery SQL
- Storage/compute separation
- Dataform

**Big Data and Data Processing VII. Analyze II**

- Looker
- Looker Studio
- Visualization

**Big Data and Data Processing VIII**

- Data lakes
- Lineage, automatizations
- Dataplex

**Preparation for the Professional Big Data Engineer Certification****Google Vertex AI – Session I**

- Introduction to Vertex AI
- MLOps
- Methodology and Technical Components
- Customer References

**Google Vertex AI – Session II**

- Training a Custom Model in Vertex AI
- Distributed Training in Vertex AI
- Hyperparameter Tuning in Vertex AI
- Hardware Accelerators for Training

**Google Vertex AI – Session III**

- Vertex AI Prediction
- Batch Predictions
- Model Monitoring
- Explainable AI

**Google Vertex AI – Session IV**

- Vertex AI Model Registry
- Vertex AI Experiments
- Model Cards

**Google Vertex AI – Session V**

- Vertex AI Pipelines
- Kubeflow Pipelines
- Components
- Pipelines
- I/O v2

**Google Vertex AI – Session VI**

- Tabular Workflows
- Hands-On Pipelines I
- Hands-On Pipelines II

**Google Vertex AI – Session VII**

- ML Metadata
- Low-Code/No-Code
- AutoML
- BQML

**Google Vertex AI – Session VIII**

- Model Garden: LLMs/LRMs in Vertex AI
- LLMOps in Vertex AI
- Vertex AI Workbench
- Colab Enterprise

**Preparation for Professional ML Engineer Certification****Legal Aspects (Open AI)**

- Open AI
- Types of Licenses for AI Components
- Model Cards
- Intellectual Property Rights and Their Role
- Impact of Regulation on Models
- Case Studies

**State of the Art in Artificial Intelligence**

- Inspiration and Research Directions for Master's Thesis Projects

**Professional Big Data Engineer Certification Exam****Professional ML Engineer Certification Exam****Module 5 | Advanced and Generative Artificial Intelligence**

150 Teaching hours

**Kohonen Networks**

- Unsupervised Competitive Networks
- 2D Self-Organizing Maps (SOMs)
- 3D Self-Organizing Maps
- Solving the Traveling Salesman Problem with Self-Organizing Maps

**Genetic Algorithms**

- Objective Function
- Selection Strategies
- Crossover
- Mutation
- Generational Replacement

**Swarm Algorithms**

- Ant Colony Optimization (ACO)
  - Environment Construction
  - Path Selection
  - Pheromone Quantity
  - Evaporation
  - Pruning toward the Optimal Solution
- Other Swarm Algorithms (ABC, Bacterial Foraging, Herd/Pack Methods, PSO, ...)

**Fuzzy Logic**

- Fuzzy Sets and Degrees of Membership
- Fuzzy Operators
- Rule Creation
- Fuzzification
- Defuzzification

**Natural Language Processing I**

- Corpora and Stopwords
- Word2Vec Models; Language Representation
- NLP Models and Sequence-to-Sequence Models
- Bucketing & Padding

**Natural Language Processing II**

- Supervised Learning in NLP; Defining the Language Domain
- Named Entity Recognition: Entity Detection and Financial Applications
- Text Classification: Headlines, Reports, News
- Sentiment Analysis: News and Social Media

**Natural Language Processing III**

- Transfer Learning in NLP; TensorFlow Hub
- Pre-trained Models: BERT, ELMo
- Fine-tuning Pre-trained Models for Specific Tasks

**Natural Language Processing IV**

- Attention Layers
- Attention-based Models
- Introduction to Transformer Models

**Natural Language Processing V**

- Advanced Transformer Models
- Generative Pre-Training: GPT Models
- PaLM, Chinchilla, Flamingo, Minerva, Gato

**Generative Models I**

- Dimensionality Reduction and Factors: PCA
- Autoencoders; Non-linear Models
- Maximum Likelihood and GMM
- Generation of Stock Quotes with PCA + GMM
- GANs, Diffusion Models, and Conditional Models

**Generative Models II**

- Deep Generative Models
- Variational Autoencoders (VAE)
- Memory-Augmented Autoencoders (MAAE)
- Sparse Autoencoders
- Generative Adversarial Networks (GAN)
- Recurrent Generative Models
- Normalizing Flows

**Generative Models III**

- Pre-training Large Language Models
- Tuning
- PEFT (Parameter-Efficient Fine-Tuning)
- Distillation
- Frameworks: T5X, PAX, Others
- TPU Architectures

**Generative Models IV**

- Introduction to LangChain
- Components I: Memory, Models, and Prompt
- Components II: Retrieval, Chains, and Agents
- RAG Techniques (Retrieval-Augmented Generation)

**Recommender Systems**

- Clustering of Profiles and Assets
- Generation and Assignment of Recommendations
- TensorFlow Recommenders
- Similarity-based Systems
- Factorization-based Systems
- Deep-Learning-based Systems

**Anomaly Detection and Analysis**

- Types of Anomalies: Point, Contextual, Collective
- Linear Methods: PCA, MCD, LMDD, One-Class SVM
- Proximity Methods: Local Outlier Factor, Histogram-based Outlier Score
- Probabilistic Methods: Angle-Based Outlier Detection, Stochastic Outlier Selection
- Ensemble Methods: Isolation Forest, Feature Bagging, LSCP, LODA
- AI-based Methods: XGBOD (Extreme Boosting-Based Outlier Detection), Deep Autoencoders

**Fair Learning**

- Model Adjustment Methods for Fair Learning
- Information Theory
- Dependence via Kernel Methods
- Dependence via Multivariate Gaussianization

**Explainable Artificial Intelligence (XAI) I**

- Reverse-Engineering Methods
- Explainability in Machine Learning (General)
- XAI in Deep Learning
- XAI Tooling

**Explainable Artificial Intelligence (XAI) II**

- Nature of XAI Algorithms
  - Interpret vs. Explain vs. Transparency; Local vs. Global Explainability
  - Task-Specific vs. Model-Agnostic Explainability
  - Model Transparency
- Challenges in eXplainable Deep Learning (XDL)
- Data Visualization/Explainability
- Global Explainability
  - Component Analysis of Models (Neural Networks, Trees, SVM)
- Local Explainability
  - Permutation
  - Substitution: LIME (Local Interpretable Model-Agnostic Explanations)
- Measuring the Degree of Explainability

**Explainable Artificial Intelligence (XAI) III**

- Explainability Strategies for Deep Learning
  - Perturbation-based Explainability
  - Gradient-based Local Explainability
  - Relevance-based Local Explainability: LRP
- Explainability for Recurrent Networks
  - Vanishing Gradient Problem: Why It Affects Explainability
  - Mitigation: Processing All Time Steps
  - Gradient- and LRP-based Explainability for RNNs

**Explainable Artificial Intelligence (XAI) IV**

- Transparency of Recurrent Networks
  - Can an RNN Be Interpreted as a State Machine?

- Can an RNN Serve as an Oracle to Infer State Machines?
- Workshops
  - Adversarial Image Attacks Derived from Explainability
  - Audio Signal Filtering via Explainability
  - Spatio-Temporal Analysis of Biological Signal Processing (P300-ERPs) via Explainability

#### **Explainable Artificial Intelligence (XAI) V**

- Fundamentals of Causal Inference
- Causal Estimation Techniques
- Applied ML
- Counterfactual Reasoning and Structural Models
- Advanced Causality and Real-World Applications
- Features and Heatmaps
- Sparse Representations
- XAI for Specific Model Families:
  - Transformers
  - Generative Models
  - Reinforcement Learning

#### **Reinforcement Learning I**

- Markov Decision Processes
- Learning Algorithms
- Function Approximation
- Q-Learning
- Double Q-Learning
- SARSA
- Search Methods

#### **Reinforcement Learning II**

- Automated Machine Learning
- Model Selection
- Architecture Search
- Full Pipeline Optimization
- Policy-based Algorithms
- Actor-Critic Methods (A2C, A3C)

#### **Reinforcement Learning III**

- Practical Review of RL System Components
- Introduction to Environment Creation
- Factors to Consider in Algorithm Design

#### **Causality**

- Causal AI & Causal Factor Investing
- Fundamentals of Causal Inference
- Causal Estimation Techniques
- Applied ML
- Counterfactual Reasoning and Structural Models
- Advanced Causality and Real-World Applications

#### **Agentic AI I**

- Deterministic AI Agents: Dialogflow
- Generative AI Agents: Playbooks
- Agentic Architectures
- Data Stores for Agents

#### **Agentic AI II**

- ADK (Agent Development Kit)
- MCP (Model Context Protocol)
- A2A (Agent-to-Agent Protocol)
- Introduction to LangChain

#### **Agentic AI – Session III**

- Agents: Foundational Concepts
- Getting Started Building Agents on Google Cloud
- Agentic Memory
- Memory Management; LLMs as Operating Systems
- Labs

#### **Agentic AI – Session IV**

- Agent Engine and Agent Garden
- Evaluation/Improvement of Agents
- AgentOps
- Labs

#### **LRM – Large Reasoning Models**

- Architectures
- Differences Between LLMs and LRMs
- Gemini 2.5 vs. OpenAI o3, o4
- Evaluation Methodology
- Use Cases

## **Module 6 | Cybersecurity and Ethical Hacking**

60 Teaching hours

#### **Security Fundamentals I: Basic Security Concepts**

- CIA Triad (Confidentiality, Integrity, Availability)
- Fundamental terms and definitions
- Evolution of information security
- Regulatory framework and international standards
  - Relevance: CISSP (D1), Security+ (D1), CASP+ (D5), CCSP (D1)

#### **Security Fundamentals II: Core Risk Management**

- Risk identification and analysis
- Vulnerability assessment
- Threat management and countermeasures
- Business Impact Analysis (BIA)
  - Relevance: CISSP (D1), Security+ (D5), CASP+ (D1), CCSP (D1)

#### **Security Fundamentals III: Security Architecture and Models**

- Reference models (OSI, TCP/IP)
- Access control models (DAC, MAC, RBAC, ABAC)
- Defense-in-depth architectures
- Network zoning and segmentation
  - Relevance: CISSP (D3), Security+ (D3), CASP+ (D1), CCSP (D1)

#### **Security Fundamentals IV: Security Controls and Categorization**

- Types of controls (administrative, technical, physical)
- Preventive, detective, and corrective controls
- Implementation of risk-based controls
- Evaluation of control effectiveness
  - Relevance: CISSP (D1, D8), Security+ (D5), CASP+ (D5), CCSP (D1)

#### **Ethical Hacking I: Introduction to Ethical Hacking**

- Definition and scope of ethical hacking
- Differences between ethical hacker, white hat, black hat, and grey hat
- Legal framework and ethical considerations
- Methodologies and standards (OSSTMM, PTES, OWASP)

### **Ethical Hacking II: Reconnaissance and Information Gathering**

- Passive footprinting techniques
- OSINT (Open Source Intelligence)
- Reconnaissance tools (Shodan, Maltego, theHarvester)
- Metadata analysis and public sources

### **Ethical Hacking III: Network Scanning and Enumeration**

- Host and service discovery
- Port scanning techniques
- Vulnerability identification with Nmap and Nessus
- Enumeration of users, services, and resources

### **Ethical Hacking IV: Web Application Vulnerabilities**

- Web application testing methodology
- OWASP Top 10 – Major vulnerabilities
- SQL Injection and Cross-Site Scripting (XSS)
- Web testing tools (Burp Suite, OWASP ZAP)

### **Ethical Hacking V: Exploitation Techniques and Privilege Escalation**

- Identification of attack vectors
- Exploitation of known vulnerabilities
- Use of exploitation frameworks (Metasploit)
- Privilege escalation techniques in Windows and Linux

### **Ethical Hacking VI: Network Security Testing**

- Man-in-the-Middle attacks
- Sniffing and traffic capture
- Analysis of insecure protocols
- Perimeter security bypass techniques

### **Ethical Hacking VII: Social Engineering and Forensic Analysis**

- Principles and techniques of social engineering
- Phishing and impersonation attacks
- Fundamentals of digital forensic analysis
- Evidence collection and analysis

### **Ethical Hacking VIII: Reporting and Best Practices**

- Documentation of vulnerabilities and tests performed
- Structure and drafting of technical reports
- Mitigation strategies and recommendations
- Planning for recurring tests and follow-up

## **Module 7 | Quantum Computing**

40 Teaching hours

### **Fundamentals of Quantum Computing I: Basic Quantum Mechanics**

- Principles of quantum mechanics
- Superposition and entanglement
- Mathematical foundations

### **Fundamentals of Quantum Computing II: Qubits and Gates**

- Quantum states
- Dirac notation
- Single-qubit gates (X, Y, Z, H)
- Controlled gates (CNOT, Toffoli)
- Circuit construction
- Bell and GHZ states
- Projective measurements
- Phase Kickback

### **Fundamentals of Quantum Computing III: Basic Algorithms**

- Bernstein–Vazirani algorithm
- Quantum teleportation
- Dense coding

### **Fundamentals of Quantum Computing IV: Quantum Hardware**

- Superconducting qubit technologies
- Trapped ions
- Photonic quantum systems
- Control and measurement
- Quantum error correction
- Scalable architectures

### **Quantum Algorithms I: Shor's Algorithm**

- Mathematical foundations
- Quantum Fourier Transform
- Phase estimation
- Detailed implementation
- Complexity analysis
- Cryptographic implications

### **Quantum Algorithms II: Grover's Algorithm**

- Quantum search
- Quantum oracle
- Amplitude amplification
- Algorithm optimization
- Practical applications
- Use cases

### **Quantum Optimization**

- Variational Quantum Eigensolver (VQE)
- Quantum Approximate Optimization Algorithm (QAOA)
- Grover Adaptive Search

### **Scenario Simulation with Quantum Computing**

- Quantum Random Walks
- Quantum Bayesian Networks

### **Master's Thesis Defense I**

### **Master's Thesis Defense II**

# AthenAI



## Certifications

You can earn up to **three AI and Cloud Services certifications** issued by Google, all while pursuing this Master's program.



# Professional Machine Learning Engineer (PMLE), Google Cloud

The **Professional Machine Learning Engineer (PMLE) certification**, issued by Google, is designed as a key credential for students, developers, and data scientists who wish to demonstrate skills in machine learning, model deployment, data governance, and AI infrastructure.

This certification is intended to validate that professionals can:

- Design scalable and maintainable ML solutions.
- Implement ML models following Google Cloud best practices.
- Assess the effectiveness and risks of deployed ML models.

## Certification Content

### Machine Learning Conceptual Framework:

- Selection of modeling techniques and data
- Hyperparameter tuning and evaluation

### ML Model Development:

- Creation of data pipelines
- Implementation of algorithms and techniques for supervised and unsupervised problems

### Production Deployment:

- Automation of ML models
- Continuous monitoring and improvement of deployed models

### Google Cloud Tools:

- Use of Vertex AI, TensorFlow, and BigQuery ML

## Benefits for Students

- Global Recognition by Google
- **Enhanced Employability and Credibility:** ML and Google Cloud skills are highly sought after across various industries, including finance.
- **Access to an Innovation Ecosystem:** GCP products and AI technologies are constantly evolving; this certification demonstrates that the student is prepared and officially certified by Google.

To obtain this certification, students must pass an exam of approximately **2 hours**, consisting of **50–60 multiple-choice questions**, taken remotely under supervision without access to reference materials.

The exam fee is **200 USD**, which must be paid directly to Google by the student.



# Professional Cloud Architect (PCA), Google Cloud

The **Professional Cloud Architect (PCA) certification**, issued by Google, is designed to validate the skills required to design, develop, and manage secure, scalable, and highly available infrastructures on Google Cloud Platform (GCP). It is an essential credential for professionals seeking to master cloud architecture with a practical and strategic approach.

This certification demonstrates that professionals are capable of:

- Designing robust, efficient, and secure cloud architectures.
- Managing infrastructure solutions that meet technical, business, and regulatory requirements.
- Monitoring, optimizing, and securing the performance of cloud environments.

## Certification Content

### Cloud Architecture Design:

- Selecting appropriate services for different business needs
- Defining network, storage, compute, and database structures

### Security and Regulatory Compliance:

- Implementing access control, encryption, and auditing policies
- Ensuring alignment with regulatory frameworks such as GDPR or MiFID II

### Management and Optimization of GCP Solutions:

- Monitoring resources and performance
- Automating tasks using tools like Cloud Deployment Manager and Terraform

### Specific Use Cases:

- Implementing financial analytics, big data, and AI solutions on GCP

### Google Cloud Tools:

- Cloud Storage, Compute Engine, Kubernetes Engine, BigQuery, Cloud IAM, among others

## Benefits for Students

- **International Recognition:** Official certification issued by Google Cloud.
- **High Employability:** Cloud architecture skills are essential in banking, fintech, and capital markets.
- **Preparation to Lead Digital Transformation:** Students will be equipped to design solutions that meet the highest standards in the financial sector.

To obtain this certification, students must pass an exam of approximately **2 hours**, consisting of **50–60 multiple-choice questions**, taken remotely under supervision without access to reference materials.

The exam fee is **200 USD**, which must be paid directly to Google by the student.



# Professional Data Engineer (PDE), Google Cloud

The **Professional Data Engineer (PDE) certification**, issued by Google Cloud, is aimed at professionals who design, build, and optimize scalable, secure, and value-oriented data processing systems. This credential certifies key skills for turning data into actionable insights, which is essential in the financial sector.

This certification validates that professionals can:

- Design and build efficient, scalable data processing systems.
- Integrate and transform large volumes of structured and unstructured data.
- Ensure data security, integrity, and governance.
- Apply machine learning techniques to extract advanced insights.

## Certification Content

### Data System Design:

- Architectures for data ingestion, storage, and analysis
- Selection of technologies for streaming and batch data

### Data Pipeline Construction:

- Implementation of processing workflows using tools such as Dataflow, Pub/Sub, Dataproc, and Apache Beam
- Data cleaning, transformation, and enrichment

### Data Modeling and Analysis:

- Using BigQuery for real-time analytics
- Applying machine learning models to large-scale datasets

### Security and Compliance:

- Access management, auditing, and regulatory compliance in regulated environments

### Key Google Cloud Tools:

- BigQuery, Cloud Composer, Dataflow, Dataproc, Pub/Sub, Vertex AI

## Benefits for Students

- **Globally Recognized Certification:** Endorsed by Google Cloud and acknowledged by leading companies in the financial and technology sectors.
- **High Employability:** The role of Data Engineer is highly sought after due to its critical role in digital transformation.
- **Practical Skills for the Financial Sector:** Specific preparation for working with high-frequency financial data, market history, and risk analysis.

To obtain this certification, students must pass an exam of approximately **2 hours**, consisting of **50–60 multiple-choice questions**, taken remotely under supervision without access to reference materials.

The exam fee is **200 USD**, which must be paid directly to Google by the student.



# AthenAI



# Career Opportunities

Become a ***Top Technical Lawyer*** by mastering Law, AI, Cloud Services, Blockchain, Financial Markets, and Crypto Assets— all from a legal perspective.



## One Master's Program, Multiple Career Paths

The Master's program offers **powerful, ambitious, and highly relevant career paths** aligned with legal profiles in the emerging law-technology paradigm. Several natural routes exist upon program completion, though they are not exhaustive:

### ▪ Law Applied to Insurance

Graduates can specialize in legal advisory for insurers and reinsurers in the digital context, covering topics such as policy automation via smart contracts, cyber risk management, and regulatory compliance for AI-based insurance.

### ▪ Law Applied to Digital Banking

Students will be qualified to serve as legal advisors in digital banks, neobanks, and fintechs, providing guidance on cloud-based financial services, PSD2 compliance, and regulations on credit scoring algorithms.

### ▪ Law Applied to Digital Payments

Professionals trained in the Master's program can provide legal advice to PSPs (Payment Service Providers), wallets, and payment platforms, ensuring secure solutions compliant with European and international regulations on electronic payments and crypto-assets.

### ▪ Law Applied to Securities Markets

Graduates will be prepared to work in supervisory bodies, investment firms, or legal advisory roles related to asset tokenization, regulation of algorithmic trading platforms, and MiFID compliance in the digital environment.

### ▪ Law Applied to Crypto-Asset Services and Markets

Opportunities open in law firms, exchanges, and crypto-asset operators, assisting in interpreting and applying MiCA regulations, designing compliance frameworks for ICOs, and legally structuring new decentralized financing models.

### ▪ Law Applied to Platform and Distributed Services

Graduates can join legal teams of major digital platforms, marketplaces, or tech companies to advise on platform governance, intermediary obligations, and compliance with the Digital Services Act (DSA).

### ▪ Law Applied to DLT, Ledgers, and Blockchain Technology

The program equips students to work on projects utilizing decentralized technologies, providing legal support regarding liability, legal validation of blockchain-registered transactions, and smart contracts.

- **Law Applied to Digital Transformation and Sustainability**

Graduates can work with companies and consultancies on digital transformation projects with an ESG perspective, ensuring compliance with technological regulatory frameworks that have social and environmental impact, and promoting sustainable digital best practices.

- **Law Applied to Digital Identity**

This profile enables work in public institutions, technology companies, and financial organizations on identity verification, data protection, and eIDAS 2.0 compliance, as well as the legal design of digital wallets and verifiable credentials.

- **Law Applied to Artificial Intelligence Systems**

Graduates can join law firms, compliance teams, or public administrations to assess legal risks of algorithms, ensure transparency, and guarantee compliance with the EU AI Regulation (AI Act).

- **Law Applied to Trust Service Providers**

This path includes working with electronic signature providers, digital seal services, timestamping, and digital custody services, in line with eIDAS regulations and their technical and legal implications.

- **Law Applied to Cryptography**

Professionals can provide specialized legal services in confidentiality and information security, interpret regulations on encryption, and conduct legal audits of cryptographic systems in regulated sectors.

- **Law Applied to Cybersecurity**

Graduates will be prepared to participate in legal teams handling incident response, compliance with regulations such as NIS2, security breach impact analysis, and the design of internal legal cybersecurity policies.

## Comparison of Profiles

	Content	Other National Master's	Other International Master's	Essential Technical Lawyer	Top Technical Lawyer	
Law	Law Applied to Insurance	Expert	Expert	Expert	Expert	
	Law Applied to Digital Banking	Expert	Expert	Expert	Expert	
	Law Applied to Digital Payments	Expert	Expert	Expert	Expert	
	Law Applied to Securities Markets	Advanced	Advanced	Expert	Expert	
	Law Applied to Crypto-Asset Services and Markets	Advanced	Advanced	Expert	Expert	
	Law Applied to Platform and Distributed Services	Advanced	Expert	Expert	Expert	
	Law Applied to DLT, Ledgers, and Blockchain Technology	Advanced	Expert	Expert	Expert	
	Law Applied to Digital Transformation and Sustainability	Advanced	Expert	Expert	Expert	
	Law Applied to Digital Identity	Expert	Expert	Expert	Expert	
	Law Applied to AI Systems	Advanced	Advanced	Expert	Expert	
	Law Applied to Trust Service Providers	Expert	Expert	Expert	Expert	
	Law Applied to Cryptography	Advanced	Expert	Expert	Expert	
	Law Applied to Cybersecurity	Advanced	Expert	Expert	Expert	
	Technology	Risks, Governance, and Strategic Fundamentals	-	Advanced	-	Expert
		Financial Markets and Crypto-Assets	-	-	-	Expert
Blockchain and Decentralized Market Infrastructure		-	-	-	Expert	
Programming Fundamentals		-	-	Expert	Expert	
Cloud Services and Big Data		-	Advanced	Advanced	Expert	
Machine Learning and Deep Learning		-	Beginner	Advanced	Expert	
Advanced and Generative AI		-	Beginner	Advanced	Expert	

# Toolbox Upon Completion

**Programming Language**



Python

**Cloud Architecture**



Google Cloud

**Machine Learning (ML)**

- Frameworks: TensorFlow, PyTorch, Keras
- Model evaluation
- Data visualization
- Clustering algorithms

**Deep Learning (DL)**

- Convolutional Neural Networks (CNN)
- Recurrent Neural Networks (RNN)
- Principal Component Analysis (PCA)
- Natural Language Processing (NLP)
- Probabilistic Graphical Models (PGM)
- Bayesian Networks (BN)
- Generative Adversarial Networks (GAN)
- Variational Autoencoders (VAE)
- Deep Autoencoders (AE)
- Reinforcement Learning (RL)
- Recommendation Systems
- Transfer Learning (TL)
- Large Language Models (LLM)
- Explainable AI (XAI)
- AI Agents
- ...

**Technology Law and Regulatory Frameworks**

- Applied to:
- Artificial Intelligence
  - Digital Transformation and Sustainability
  - Platform and Distributed Services
  - Cybersecurity
  - Digital Identity
  - Data Governance

**Governance and Strategic Fundamentals**

- Business strategy
- AI project management

**Risk management**

- Advanced risk management
- AI-related risks
- Compliance and legal aspects (regulations, audits, contracts, data privacy, etc.)
- Key technology and AI roles within an organization
- Vendor management and evaluation
- Data governance

**Finance and Crypto-Assets**

- Equities
- Futures
- Options
- Currencies
- Fixed income
- Commodities
- Crypto-assets
- Portfolio optimization and management
- Wealth management

**Governance and ISO Standards**

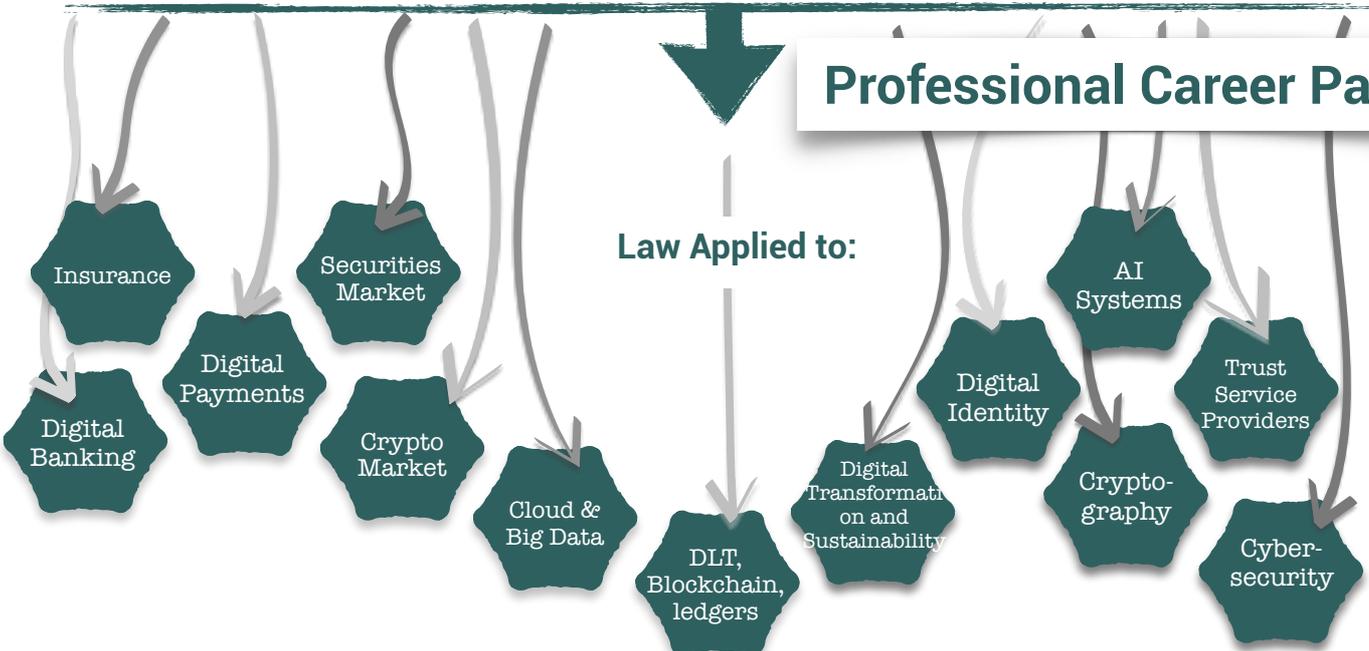
- AI Management System (ISO/IEC 42001)
- Governance of Disruptive Technologies (ISO/IEC 38507)
- Risk Management in AI Systems (ISO/IEC 23894 & 31000)

**You Will Achieve:**



## Professional Career Paths

**Law Applied to:**



# Faculty of Experts and Instructors

The faculty is the ***most valuable asset of the Master's program***, which is why the selection of professors is one of the aspects to which we have devoted the most time and attention.



Professor		Specialty	Education	Current Position
	<b><u>Álvaro Suárez Bravo</u></b>	Blockchain	<ul style="list-style-type: none"> <li>- Computer Engineering Degree</li> <li>- Master in Computer Science</li> </ul>	Principal Software Engineer <b>DLT Finance AG</b>
	<b><u>Ángel Luis Quesada Nieto</u></b>	Blockchain	<ul style="list-style-type: none"> <li>- Mathematics Degree</li> <li>- MBA, Master in Business Management for Entrepreneurs</li> </ul>	Founder & CEO, <b>Onyze, Kubide &amp; Climbspot</b>
	<b><u>Antonio Bravo Jiménez</u></b>	Finance	<ul style="list-style-type: none"> <li>- Specialization in Company Valuation</li> <li>- Specialization in Financial Options and Futures</li> <li>- Business Administration Degree</li> </ul>	Head of Equity, <b>Cecabank</b>
	<b><u>Carlos Muñoz Ferrandis</u></b>	Law	<ul style="list-style-type: none"> <li>- Law Degree</li> <li>- Master in Legal Practice</li> <li>- Master in Intellectual Property and IT Law</li> <li>- PhD in Philosophy, PhD Candidate in Law</li> </ul>	Co-founder & COO, <b>Alinia AI</b>
	<b><u>César Sanz</u></b>	Finance	<ul style="list-style-type: none"> <li>- Master in Economics and Financial Markets</li> <li>- Economics Degree</li> </ul>	Trader in Equities, Derivatives & Market Making <b>Cecabank</b>
	<b><u>Daniel Dorado García-Marina</u></b>	Finance	<ul style="list-style-type: none"> <li>- Master in AI and Quantum Computing Applied to Financial Markets (MIAX)</li> <li>- Business Administration Degree</li> </ul>	Head of Credit and Equity Trading, <b>Cecabank</b>
	<b><u>David del Val</u></b>	Finance	<ul style="list-style-type: none"> <li>- Dual Degree in Economics and Law</li> <li>- Master in Macroeconomic and Financial History</li> <li>- Former Economist and Presidential Advisor at La Moncloa</li> </ul>	Senior Economist, International Economics and Markets <b>CaixaBank Research</b>
	<b><u>Gloria Hernández Aler</u></b>	Law <b>Academic Direction</b>	<ul style="list-style-type: none"> <li>- Law Degree</li> <li>- Master in Securities &amp; Financial Regulation</li> </ul>	Co-founding Partner <b>finReg</b>

Professor		Specialty	Education	Current Position
	<b><u>Gonzalo Navarro Ruiz</u></b>	Law  <b>Academic Direction</b>	<ul style="list-style-type: none"> <li>- Law Degree</li> <li>- Business Administration Degree</li> <li>- Master in Corporate Legal Advisory (Top of class)</li> <li>- PhD in Corporate Law &amp; Capital Markets (Summa cum laude)</li> <li>- Executive MBA</li> </ul>	Partner of Financial Regulation & Capital Markets <b>Crowe Spain</b>
	<b><u>Guillermo Meléndez Alonso</u></b>	Artificial Intelligence	<ul style="list-style-type: none"> <li>- Diploma in Business Administration (Top of class),</li> <li>- Business Administration Degree (Top of class)</li> <li>- Master in Auditing</li> <li>- Master in Quantitative Finance</li> <li>- Master in Stock Market &amp; Alternative Investments</li> <li>- Master in Data Science &amp; Big Data (Top of class)</li> <li>- Master in Deep Learning (Top of class)</li> </ul>	CEO <b>AthenAI</b>
	<b><u>Jesús Mardomingo</u></b>	Law  <b>Academic Direction</b>	<ul style="list-style-type: none"> <li>- Lawyer with over 35 years of professional experience and a renowned partner in the Banking and Finance practice at Dentons, the largest law firm in the world.</li> </ul>	Partner <b>Andersen</b>
	<b><u>Jesús Sanz del Real</u></b>	Artificial Intelligence + Finance	<ul style="list-style-type: none"> <li>- Law Degree</li> <li>- Business Administration Degree</li> <li>- Master in Applied AI for Financial Markets (MIAX)</li> <li>- CFA Level II</li> </ul>	Associate Team Leader & Data Scientist <b>Oliver Wyman</b>
	<b><u>Jorge Soriano Lázaro</u></b>	Cryptoassets	<ul style="list-style-type: none"> <li>- Architecture Degree</li> </ul>	Co-founder & CEO <b>Criptan</b>
	<b><u>Jose Zamora</u></b>	Artificial Intelligence	<ul style="list-style-type: none"> <li>- Dual Degree in Computer Science &amp; Hardware Engineering</li> <li>- Master in Computer Vision</li> <li>- Master in Digital Intelligence</li> <li>- MBA</li> </ul>	Director of AI, GenAI & MLOps
	<b><u>Luis Fernando Lago Fernández</u></b>	Artificial Intelligence + Mathematics	<ul style="list-style-type: none"> <li>- Physics Degree</li> <li>- Mathematics Degree</li> <li>- PhD in Computer Science</li> </ul>	Biological Neurocomputing Department, <b>Technical University of Madrid</b>

Professor		Specialty	Education	Current Position
	<b><u>Manuel Sánchez Montañés Isla</u></b>	Artificial Intelligence	<ul style="list-style-type: none"> <li>- Physics Degree</li> <li>- PhD in Computer Engineering</li> </ul>	Researcher, <b>Autonomous University of Madrid</b>
	<b><u>Miguel García Cordo</u></b>	Artificial Intelligence	<ul style="list-style-type: none"> <li>- Master in Applied AI for Financial Markets (MIAX)</li> <li>- Master in AI (AI Institute)</li> <li>- ISO 42001 AI Management Leader Certificate</li> <li>- ISO 38507 AI Governance Leader Certificate</li> </ul>	Chief Risk Officer (CRO) <b>Inversis</b>
	<b><u>Miguel Jaureguizar</u></b>	Finance + Blockchain	<ul style="list-style-type: none"> <li>- Telecommunications Engineer (Honors)</li> <li>- Advanced Studies Diploma (DEA) in Applied Economics</li> <li>- Postgraduate Studies in Applied Economics</li> </ul>	Director of Digital Development & Digital Assets <b>Renta4 Banco</b>
	<b><u>Minerva Rodríguez Cabrera</u></b>	Artificial Intelligence	<ul style="list-style-type: none"> <li>- Master in Applied AI for Financial Markets (MIAX)</li> </ul>	Chief Operations Officer (COO) <b>AthenAI</b>
	<b><u>Pedro Ventura Gómez</u></b>	Artificial Intelligence	<ul style="list-style-type: none"> <li>- Master in Applied AI for Financial Markets (MIAX, 1st cohort)</li> <li>- Expert in Back Office Management &amp; Financial Services</li> <li>- Telecommunications Engineer</li> </ul>	Project Director, <b>March Asset Management</b>
	<b><u>Rafael Sánchez</u></b>	Artificial Intelligence + Big Data	<ul style="list-style-type: none"> <li>- Telecommunications Degree</li> <li>- PhD in Engineering &amp; Telecommunications</li> </ul>	Manager, Generative AI / ML, Southern Europe & Middle East, <b>Google</b>
	<b><u>Raquel Hernández Falcón</u></b>	Artificial Intelligence	<ul style="list-style-type: none"> <li>- Degree in Mathematics, Statistics &amp; Research</li> <li>- Master in Applied AI for Financial Markets (MIAX)</li> <li>- Master in Quantitative Finance</li> </ul>	Credit Trader <b>CecaBank</b>

# AthenAI



# General Information



## General Information

### Duration



Full program equivalent to 125 ECTS

#### Technical Lawyer Essential

- Equivalent to 54 ECTS
- 450 teaching hours
- 1.350 teaching + study hours
- 12 months

<i>Start Date</i>	→	<i>End Date</i>
October 2nd, 2026		September 28th, 2027

#### Top Technical Lawyer

- Equivalent to 71 ECTS
- 590 teaching hours
- 1.770 teaching + study hours
- 15 months

<i>Start Date</i>	→	<i>End Date</i>
April 7th, 2028		June 29th, 2029

### Schedule



Wednesday and Thursday from 7:00 PM to 9:30 PM

Friday from 4:00 PM to 9:00 PM

Saturday from 9:00 AM to 2:00 PM

- \* Wednesday, Thursday, and Friday classes will be conducted exclusively online.
- \* Saturday classes will be delivered both in-person and online.

### Location



Essential master's programs are delivered entirely online.

Top master's programs combine online training with in-person sessions, although they may also be completed fully online. All in-person sessions take place in Madrid.

### Price



The price of the **Technical Lawyer Essential** program is €11,000.

The price of the **Top Technical Lawyer** program is €15,000.

The price for the **Full program** is €26,000.

## Content recognition between master's programs: a unique advantage



Focused on Financial Markets, AI, and Quantum Computing

Focused on Cybersecurity, AI, and Quantum Computing

Focused on the role of Chief Artificial Intelligence Officer (CAIO)

Focused on Law and Emerging Technologies

At our school, each master's program specializes in a different area, yet all share a common knowledge base in the new technologies modules: Python, AI, Cloud Services, Cybersecurity, Quantum Computing...

This structure allows students to take the common subjects only once, benefiting from automatic **content recognition in any other master's program** they choose.

For example, if you first complete the **Top Technical Lawyer** Master's program, priced at **€26,000**, you will have covered much of the common content of other master's programs, so:

- You can access the other master's programs with automatic recognition of the previously completed content modules\*.
- The price of the subsequent master's programs will be significantly reduced\*\*.
- You could **complete all four master's programs for only €50,000\*\*\***, instead of paying €108,000 (€27,000 × 4 master's programs).

***This creates a powerful leverage effect on your education: more knowledge, greater specialization, lower cost.***

\* If you access a master's program with more than 50% of its content recognized, it will be offered exclusively online.

\*\* The price of each master's program will be at least 20% of its original value.

\*\*\* This price is an approximate example, as it may vary depending on each master's program.

\*\*\*\* Recognitions can only be applied if the original master's program has been successfully completed.

# AthenAI

In 2025, AthenAI established a program to train the world's top tech lawyers. Its purpose was to teach how to combine law and Advanced Artificial Intelligence to lead a new generation of law firms.

The official name of the Master's program was:

***“New Technologies Applied to Law and  
Law Applied to New Technologies”.***

Students referred to it as...

# Top Technical Lawyer

