AthenAI
Institute of Technology

Top Level-C Essential → Top

Emerging Tech & Digital Executive Leadership

1st Edition

CCSP ISC2 | CISSP ISC2 | CompTIA Security+ | CompTIA CASP+ | Google Cloud Certified Professional Machine Learning Engineer | Google Cloud Certified Professional Data Engineer | Google Cloud Certified Professional Cloud Architect

AthenAI

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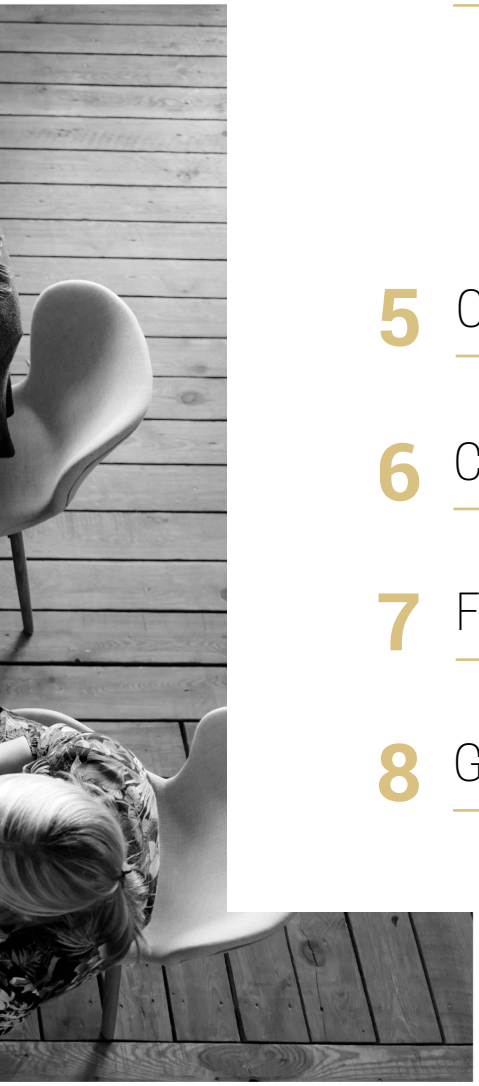

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AthenAI

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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, t**hey 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.

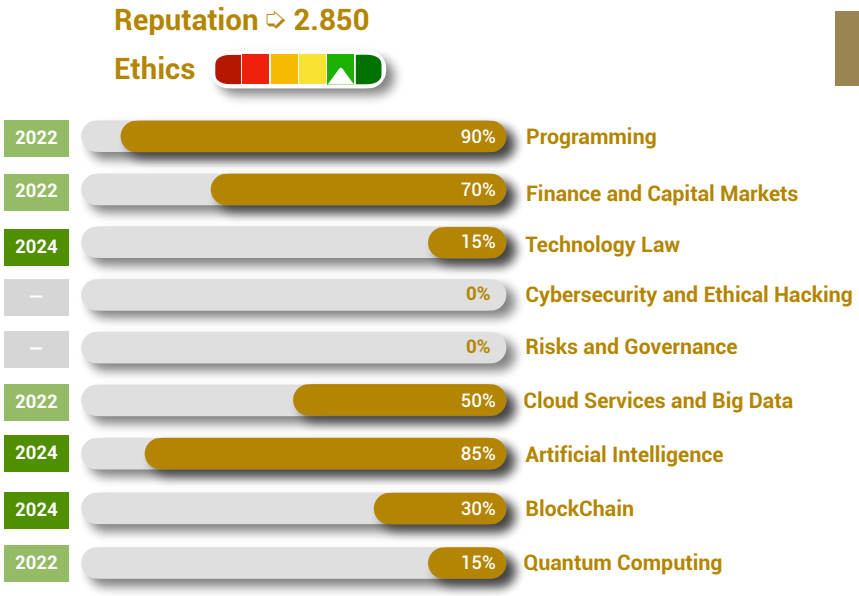
Pillar 2. Reputation

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

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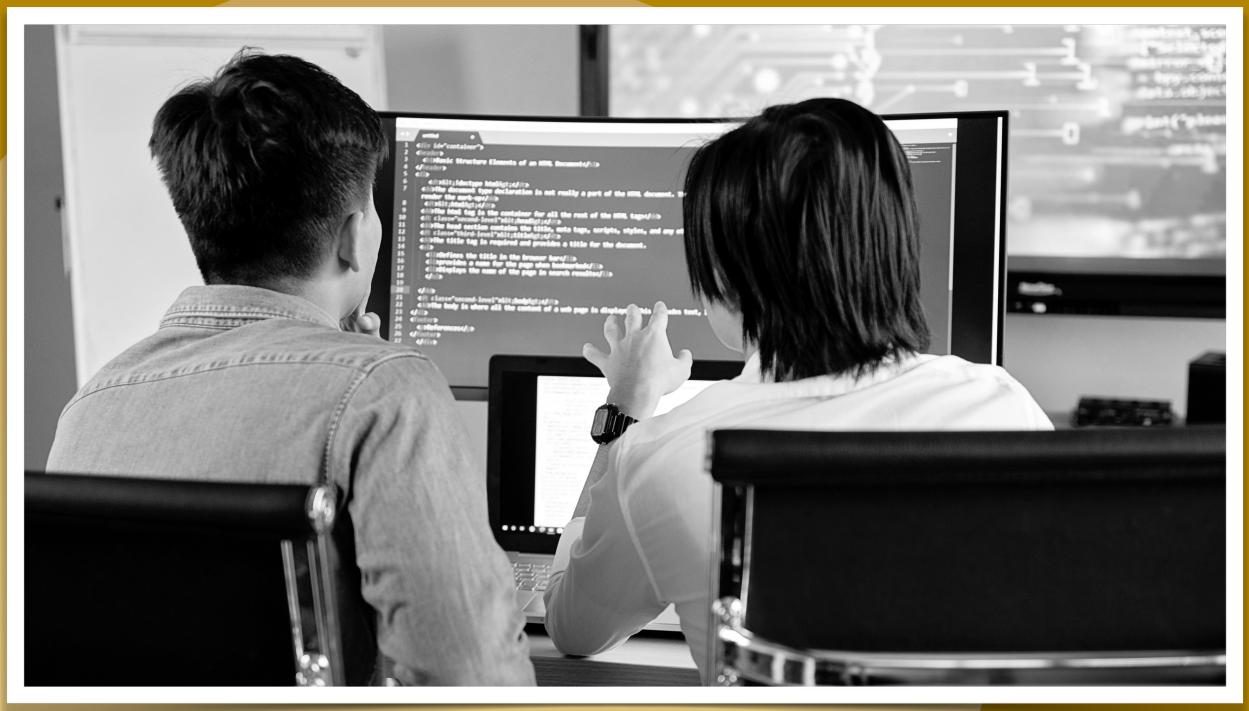
Our platform

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 r**equest 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

While most master's degrees focus on a single area of knowledge, we have created a truly ***UNIQUE*** multidisciplinary program that brings together ***technology, business, ethics, leadership, and law***.

Top Level C: Two Master's degrees that make up the most comprehensive and demanding program in the world.

Top Level C: The elite in Risk & Governance, Cybersecurity, Artificial Intelligence, and Quantum Computing.

Top Level C is not merely an educational program; it is an intellectual challenge of the highest order, designed for those who aspire to lead the future of risk and governance in the era of Artificial Intelligence and Quantum Computing. 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 enrolling in this program, students can obtain two Master's degrees:

- **Level C Essential**: 450 instructional hours, equivalent to 54 ECTS (first academic year).
- **Top Level C**: 610 instructional hours, equivalent to 72 ECTS (second academic year).

In addition, the program incorporates **7 top-tier official certifications**, awarded by leading entities in each discipline:

Level C Essential Certifications:

- Professional Cloud Architect (PCA), issued by Google.

Top Level C Certifications:

- Security+ D5 (CompTIA Security+).
- CASP+ D5 (CompTIA Advanced Security Practitioner).
- CISSP D1 (Certified Information Systems Security Professional).
- CCSP D5 (Certified Cloud Security Professional).
- Professional Data Engineer (PDE), issued by Google.
- Professional Machine Learning Engineer (PMLE), issued by Google.

Students may choose to pursue only the **Level C Essential** program, one of the most comprehensive and demanding Master's degrees available on the market, capable of transforming them into highly competitive and distinctive professionals.

Only those who seek to transcend and become true global leaders will take on the challenge of ***Top Level C***. This comprehensive program requires the successful completion of the Essential track and represents the pinnacle of training in Risk & Governance, Cybersecurity, Artificial Intelligence, and Quantum Computing.

Top Level C is not studied: ***IT IS CONQUERED***

Nature of the master's degree

Become the Chief Artificial Intelligence Officer every organization needs

This master's degree is designed **to train future leaders in Artificial Intelligence governance**, professionals capable of designing, deploying, and overseeing an end-to-end AI strategy within any organization. Throughout the program, you will acquire the necessary competencies to build a comprehensive AI governance framework, including policies, procedures, and instruments that ensure responsible, effective use aligned with corporate objectives.

The learning pathway **combines a strong technical foundation with a strategic approach**. You will progress from the mathematics underpinning AI models to their practical implementation, including advanced neural networks and next-generation foundational models. This training will enable you not only to understand and develop AI models, but also to evaluate external solutions using both technical and business criteria.

In addition, the master's degree **provides solid training in risk management and regulatory compliance**, equipping you to identify, mitigate, and manage risks associated with the entire lifecycle of AI models. You will learn to reduce uncertainty in evaluation and decision-making processes, bringing technical rigor and ethical criteria to every initiative.

In a context where cybersecurity is critical, you will also be trained in the **specific risks of AI systems**: how to anticipate them, prevent them, stress-test them, and respond to incidents, ensuring the technological resilience of your organization.

This master's degree **transforms the student into a multidisciplinary professional with a comprehensive vision of AI**, capable of leading at both strategic and operational levels, and of collaborating with key profiles such as CTOs, CISOs, risk managers, compliance officers, and transformation offices.

Ultimately, this program prepares you to assume the role of Chief Artificial Intelligence Officer (CAIO), the essential figure in any organization that aspires to use AI in a safe, responsible, and competitive manner.

Objective

Our objective is to reflect a commitment to academic and professional excellence by offering a comprehensive and transformative program that equips students with the competencies required to successfully perform the role of Chief Artificial Intelligence Officer (CAIO) in dynamic and globalized business environments.

The fundamental purpose of the master's degree is **to provide students with strategic, advanced, and differentiating training** that enables them to lead, with vision, rigor, and responsibility, the adoption and management of Artificial Intelligence solutions within their organizations.

Upon completion of the program, participants will be able to:

- **Gain an in-depth understanding of the technical foundations of AI, including both machine learning and deep learning**, applied to real business contexts.
- **Design and govern modern architectures based on cloud technologies**, integrating scalable AI platforms.
- **Master the principles of AI ethics, regulation, and governance**, including compliance with the AI Act and international frameworks.
- **Evaluate, select, and implement AI technologies** aligned with the company's strategic objectives.
- **Define, drive, and align the corporate AI strategy with business goals**, leading its cross-functional integration across the organization.
- **Manage operational, legal, and reputational risks** associated with the use of Artificial Intelligence.

- **Foster an organizational culture oriented toward responsible innovation**, promoting the ethical adoption of AI.
- **Develop critical thinking and a forward-looking vision**, anticipating technological trends and their impact on business.
- **Participate in a global community of AI experts and leaders**, creating collaboration networks and professional opportunities.

Admission profiles

This master's degree is designed to train professionals and students from diverse backgrounds, all sharing a common denominator: a passion for innovation and for acquiring the competencies and skills required to assume the role of a CAIO within organizations.

Accordingly, this master's degree is particularly aimed at professionals interested in technology, data science, strategy, and innovation; executives who wish to evolve toward C-Level roles with a focus on AI; and entrepreneurs seeking to lead AI-based businesses.

a) Current C-Level profiles

If you already hold a senior management position (such as CDO, CTO, CIO, CRO, CISO, CCO, or Digital CDO) or are in the process of transitioning toward an executive role, you likely already possess a strategic business vision and experience leading teams, projects, or key technological areas.

This master's degree is for you if you want to:

Update your knowledge in advanced Artificial Intelligence and its real-world applications in corporate environments.

- Master the strategic integration of AI across all areas of the business.
- Lead digital transformation from senior management, driving responsible innovation.
- Understand key regulatory frameworks (such as the European AI Act) and their organizational impact.
- Establish effective AI governance, ensuring scalability, ethics, and compliance.
- Interact with technical teams in greater depth, from an executive and business-oriented perspective.
- Consolidate your profile as a Chief Artificial Intelligence Officer (CAIO) and become part of a community of leaders in enterprise AI.

b) Technical profile (computer scientists, engineers, physicists, mathematicians…)

If you come from a technical background such as computer engineering, telecommunications, physics, or mathematics, you are likely to have a solid foundation in programming, calculus, and systems. However, you may not have gone deeply into:

- Advanced Artificial Intelligence and machine learning, technological tools, and business applications.
- Business models, roles, and corporate strategy that integrate AI across all organizational levels.
- AI project management and leadership.
- Vendor management and evaluation.
- Implementation of regulatory frameworks and standards.
- International AI regulations and AI-related law.
- Management of AI-inherent risks.
- Fundamentals of cybersecurity.

This master's degree is for you if you want to lead the management and direction of Artificial Intelligence projects within organizations, with a comprehensive and realistic view of the entire ecosystem.

c) **Legal, risk, or audit profile**

If you come from the world of auditing, compliance, or risk management, you likely have strong regulatory and organizational knowledge, but limited training in advanced technology and applied AI.

This master's degree is for you if you want to:

- Deepen your understanding of programming and Artificial Intelligence techniques.
- Learn business models, roles, and corporate strategy that integrate AI across all organizational levels.
- Manage and lead AI projects.
- Understand international AI regulations and AI-applied law.
- Acquire fundamentals of cybersecurity.

d) **Profile with knowledge of Artificial Intelligence**

If you are already familiar with programming and Artificial Intelligence but lack a global vision of how to manage and lead AI projects transversally within a company, this master's degree is for you. You will acquire knowledge in:

Business models, roles, and corporate strategy that integrate AI across all organizational levels.

- AI project management and leadership.
- Vendor management and evaluation.
- Implementation of regulatory frameworks and standards.
- International AI regulations and AI-applied law.
- Management of AI-inherent risks.
- Fundamentals of cybersecurity.

The first modules of the program are designed to balance the knowledge base and working methodologies of these profiles.

Required prior knowledge

Enrollment in this master's degree **does not require** participants to have a prior **technical or conceptual background**; however, a **commitment and a minimum dedication of 3 hours of daily study** will be essential.

Throughout the program, the student will **develop skills and acquire the knowledge required** in key areas to become the CAIO of an organization.
This includes in-depth knowledge of Artificial Intelligence from the perspective of models, infrastructures, architectures, and use cases; governance frameworks; regulatory frameworks and strategy; AI project management; management of risks derived from Artificial Intelligence; data governance frameworks; security fundamentals, including advanced knowledge of cybersecurity and AI applied to cybersecurity; and vendor evaluation.

This master's degree does not focus exclusively on Artificial Intelligence

To properly prepare a CAIO, this master's degree offers not only the technological knowledge required of a specialist in applied Artificial Intelligence, but also a **global vision of AI integration within organizations and how AI can be aligned with corporate objectives**. This includes, among other areas:

- Business strategy and leadership.
- Ethics, regulation, and responsibility.
- Data governance and organizational architecture.

This master's degree does not focus exclusively on Deep Learning

This master's degree provides an overview of different branches of Artificial Intelligence, with in-depth focus on those most widely used in the industry today:

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

Program certified by Google

Within this program, students may **obtain the most recognized certifications at national and international levels**.
A significant portion of the faculty in the Artificial Intelligence module is composed of Google engineers. During this module, students will receive the training required to obtain the **Cloud Architect, Big Data Engineer, and Machine Learning Engineer certifications**. These exams will be taken directly through Google's own platform, the entity responsible for certifying students' knowledge.

Employability

The **CAIO** profile stands out for its solid technical knowledge, strategic capability, leadership, change management, and ethical and legal mastery.
This results in an **emerging and still not highly standardized role**, capable of differentiating itself from other executives. There is a growing demand for truly well-prepared CAIOs, making this master's degree a significant opportunity to take a major step forward in your career.

The main factors driving this growth are:

- The **increasing investment by companies in Artificial Intelligence**, which creates the need for this technical–strategic profile to support its integration.
- **Regulatory pressure**, which requires companies to implement AI governance and ensure regulatory compliance, transparency, and ethical use of AI.
- The **complexity of AI systems**, which requires technical leadership with a transversal vision.

The level of rigor of the master's degree, together with the constant updating of its contents, turns graduates into the natural talent pool to lead the digital transformation of organizations.

Academic Direction

Miguel García Cordo

Passionate about problem-solving and the design, development, and implementation of innovative ideas and projects, he is a multidisciplinary expert with a career built at the intersection of finance and technology. His solid academic background—combining higher education in Economic Sciences (Bachelor's Degree) and Mathematical Sciences at the Complutense University of Madrid, further enriched with a Master's in Artificial Intelligence applied to Financial Markets (mIA-X) and a Master's in Artificial Intelligence delivered by the Artificial Intelligence Institute, and accredited with the international certifications ISO 42001 AI Management Leader and ISO 38507 AI Governance Leader—forms the foundation of a trajectory spanning more than fifteen years in the financial sector. His profile uniquely blends expertise in risk management and financial markets with advanced specialization in Artificial Intelligence, placing him in a privileged position to drive digital transformation.

He currently serves as **Chief Risk Officer (CRO)**, responsible for the entity's overall risk strategy and supervision. His career has been consolidated through senior leadership roles, including **Head of Risk Management and Middle Office at March Asset Management**, where he led the design and development of proprietary models for liquidity and ESG analysis, covering internal ratings, exclusion criteria, sustainability support indicators, ex-ante ESG analysis, and integrated sustainability modeling, and **Head of Risk Management at Nordkapp S.A**.

With a strong commitment to fostering synergies between academia and the private sector, he actively contributes to the training of future professionals. He teaches, serves as a thesis committee member, and supervises final master's projects in the Master in Artificial Intelligence applied to Financial Markets (mIA-X) at Instituto BME. Additionally, as a member of the Institute for the Development of Artificial Intelligence in the Financial Sector (IDIASEF), he contributes to the advancement and sound governance of AI in the industry.

Complementary and Specialized Training

- Executive and Advanced Programs in Finance and Risk:
  - Executive Program in Sustainable Finance
  - Advanced Courses in Derivatives and Counterparty Risk
  - Advanced Program in Fixed Income
  - Advanced Program in Financial Risk Management
- Specialization Programs in Technology and Data Science:
  - Master in Artificial Intelligence applied to Financial Markets (mIA-X)
  - Master in Artificial Intelligence, Artificial Intelligence Institute
  - Expert Program in Machine Learning
  - Specialization in Programming Languages and Software: Matlab, Python, R, VB.Net, and C#
  - International Certifications: ISO 42001 AI Management Leader and ISO 38507 AI Governance Leader

Domains of Specialization

- Comprehensive Financial Risk Management (Market, Credit, and Counterparty)
- Artificial Intelligence and Applied Machine Learning
- Artificial Intelligence Governance (AI Governance)
- Sustainable Finance and ESG-based Investment (Environmental, Social, and Governance criteria)
- Valuation of Derivatives and Fixed Income Instruments
- Data Science with RStudio and Quantitative Modeling with Matlab

Academic Direction

Raquel Hernández Falcón

Mathematician specialized in finance, with more than ten years of professional experience at the intersection of quantitative modeling, Artificial Intelligence, and financial markets. She combines a rigorous academic background with solid practical expertise in the valuation of financial instruments, comprehensive risk management, and the development of algorithmic solutions. Her profile stands out for the ability to translate complex problems into robust tools applicable in real and regulated environments.

She holds a degree in Mathematics, a Master's in Quantitative Finance from Afi, and a Master's in Artificial Intelligence applied to Financial Markets (mIA-X). Additionally, she has specialized training in financial risks and programming. She has contributed to high-profile projects at both the national and international levels, collaborating with various financial institutions, regulatory bodies, and clearinghouses.

She currently serves as a Credit Trader, where, in addition to her trading activity, **she specializes in the development of models and algorithms aimed at analyzing, valuing, and optimizing investment strategies in credit products**.

Committed to knowledge transfer and the training of new generations of professionals, she actively participates as a lecturer in leading master's programs, expert courses, and corporate training initiatives offered by different schools and finance institutes.

Professional Background

- Credit Trading at CecaBank
- Lecturer in multiple specialized programs
- Risk Control and Regulatory Compliance at March Asset Management
- Quantitative and Financial Consulting at Afi (Analistas Financieros Internacionales)

Areas of Expertise

- Application of Artificial Intelligence and Machine Learning in financial markets
- Programming and Data Science: Python, R, Matlab, VBA .NET, SQL
- Technologies and Platforms: AWS, Azure, Google Cloud
- Analysis and implementation of optimal investment strategies in credit products
- Identification, measurement, and management of financial risks
- Quantitative modeling and analysis for the valuation of complex financial instruments

AthenAI

4

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. Programming Fundamentals	55	5 %	110	165	**6,6**
2. Governance and Strategic Foundations	70	7 %	140	210	**8,4**
3. Machine Learning and Deep Learning	105	10 %	210	315	**12,6**
4. Cloud Services and Big Data	195	18 %	390	585	**23,4**
5. Advanced and Generative Deep Learning	175	17 %	350	525	**21**
6. Technology Law	60	6 %	120	180	**7,2**
7. Cybersecurity and Ethical Hacking	225	21 %	450	675	**27**
8. Risks and Governance	75	7 %	150	225	**9**
9. Quantum Computing	40	4 %	80	120	**4,8**
10. Launching Your Own Startup	30	3 %	60	90	**3,6**
Total	**1.060**	**100 %**	**2.120**	**3.180**	**127**

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. Programming Fundamentals	55	12 %	110	165	**6,6**
2. Machine Learning and Deep Learning	105	23 %	210	315	**12.6**
3. Governance and Strategic Foundations	70	16 %	140	210	**8,4**
4. Technology Law	60	13 %	120	180	**7,2**
5. Risks and Governance	75	17 %	150	225	**9**
6. Cloud Services and Big Data	70	16 %	140	210	**8,4**
Total	**450**	**100 %**	**900**	**1.350**	**54**

Structure of the TOP Master's Program

Modules	Teaching hours	Wt	Study hours	Total hours	ECTS
0. Introduction and TFM Sessions	15	2 %	30	45	**1,8**
1. Cloud Services and Big Data	125	20 %	250	375	**15**
2. Advanced and Generative Deep Learning	175	29 %	350	525	**21**
3. Cybersecurity and Ethical Hacking	225	37 %	450	675	**27**
4. Quantum Computing	40	7 %	80	120	**4,8**
5. Launching Your Own Startup	30	5 %	60	90	**3,6**
Total	**610**	**100 %**	**1.220**	**1.830**	**73**

ESSENTIAL Program

Module 1 | Programming Fundamentals
55 Teaching hours

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

Python Programming Fundamentals I
- Installation
- Jupyter Notebooks
- Basic syntax, operations, and primitive data types
- Strings
- Data structures: Lists, Tuples, Sets, and Dictionaries

Python Programming Fundamentals II
- Control Flow
- Dictionary 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
- Time Series Processing
- Risk Measurement Simulation (VaR)
- Portfolio Optimization

Python Programming Fundamentals VI
- 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 VII
- Object-Oriented Programming
- Inheritance
- Decorators

Python Programming Fundamentals VIII
- Introduction to HTML
- Web Scraping

Python Programming Fundamentals IX
- Fundamentals of Relational Databases
  - Creating and Manipulating Your Own Databases
  - Importing Relational Data into Python
  - Filters, Sorting, and Grouping in Queries
- Advanced Queries with SQLAlchemy
- Introduction to MongoDB in Python

Python Programming Fundamentals X
- Efficiency Analysis
- Error Management, Testing, and Debugging
  - Types of Testing (Unit, Integration, Functional, and Acceptance Testing)
  - Testing Tools (pytest and unittest)
  - Debugging (Stack Traces, Breakpoints, and Variable Inspection)
- IDEs Beyond JupyterLab

Advanced Visualization Techniques
- Introduction to HTML
- Introduction to CSS
- Introduction to Flask
- Interactive Interfaces with Dash

Module 2 | Machine Learning & Deep Learning
105 Teaching hours

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

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

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

State of the Art in Artificial Intelligence
- Inspiration and Research Directions for Master's Thesis Projects

Module 3 | Governance and Strategic Foundations
70 Teaching hours

Introduction and History of Artificial Intelligence – Technical Approach
- What is AI?
- History of AI
- Different Types of AI
- Techniques and Tools
- Classical Algorithms
- Ethical and Social Challenges

Evolution of AI and Its Business Impact
- Key Stages: Symbolic AI, Machine Learning, Deep Learning, Generative AI
- Representative Use Cases in Each Stage
- Effects on Efficiency, Productivity, and Business Models
- Organizational Changes Driven by AI
- Emerging Risks and Challenges: Ethical, Regulatory, Technological

Business Strategy
- AI in Organizations
- Business Models
- Strategic Decision-Making
- Digital Transformation

AI Project Management I
- Planning and Management
- ML Ops
- Technical Profiles

AI Project Management II
- When to Use ML and Problems to Solve
- Software in Production
- Infrastructure
- Best Practices in Development
- Best Practices in Deployment
- Tools

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

Legal Aspects (Open AI)
- Open AI
- Types of Licenses for AI Components
- Model Cards
- Role of Intellectual Property Rights
- Impact of Regulation on AI Models
- Case Studies

International Regulatory Frameworks
- EU AI Act: Risk Categories and Obligations
- Relevant ISO Standards: 23894 (Risk Management), 42001 (AI Management Systems), 22989 (Terminology), among others
- OECD Principles and UNESCO Guidelines on Responsible AI
- Comparative Approaches: EU, U.S., China, and Other Geopolitical Blocs
- 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: Management System for the AI Lifecycle (AI Management System)
- ISO 38507: AI Governance in the Context of Corporate Leadership (Complementing ISO 38500)
- ISO 31000: General Framework for Risk Management Also 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, Impact)
- Support (Resources, Risks, Communication, Documentation)
- Operations (Risk Assessment and Treatment)
- Continuous Improvement

Introduction to ISO Standards III – Governance of Disruptive Technologies (ISO/IEC 38507)
- Scope
- Terms and Definitions
- Implications for Governance of Organizational Use of AI
- Overview of AI and AI Systems
- Policies for Addressing the Use of AI
- Governance and Organizational Decision-Making

Introduction to ISO Standards IV – Risk Management in AI Systems (ISO/IEC 23894 and 31000)
- Design, Implementation, and Evaluation
- Comprehensive Risk Identification and Monitoring Process
- Reporting Process
- Objectives

- AI Lifecycle

ISO Certification - AI Management Leader (ISO/IEC 42001)

ISO Certification - AI Governance Leader (ISO/IEC 38507)

Module 4 | Technology Law
60 Teaching hours

Artificial Intelligence Regulation

- Risk-based approach: Classification of AI systems into four levels (unacceptable risk, high risk, limited risk, and minimal risk)
- Obligations for high-risk systems: Conformity assessment, technical documentation, traceability, and human oversight
- Explicit prohibitions: Systems that manipulate human behavior, social scoring, and real-time biometric surveillance without authorization
- Transparency requirements: Clear notification to users when interacting with AI systems (chatbots, deepfakes, etc.)
- Business impact: New obligations for developers, importers, distributors, and users of AI in the European market

Applied Law for Artificial Intelligence I

- Legal frameworks for Artificial Intelligence in Europe, the USA, Asia, and the Middle East
- Liability associated with AI systems (Part I)
- Roles of operator/producer and their legal implications
- Cases of autonomous learning systems and scenarios of online and offline learning

Applied Law for Artificial Intelligence II

- Liability associated with AI systems (Part II)
- The New Artificial Intelligence Regulation
  - Legal framework for advisory services / investment algorithms / MiFID II
  - Requirements for high-frequency and low-frequency algorithms
  - Traceability and associated responsibilities
- Data protection
- Case studies on liability in AI usage

Applied Law for Artificial Intelligence III

- The importance of ethics in AI regulation
- Personal data protection regulations in AI systems
- The AI Sandbox
- The Spanish Agency for AI Supervision
- Malfunction vs. past performance does not guarantee future returns

Applied Law for Digital Transformation and Sustainability I

- Relationship between FinTech and sustainability, and different areas of collaboration between FinTechs
- Sustainable finance from a theoretical perspective, with practical examples
- EU Sustainable Finance Action Plan: regulatory background and context
- Regulatory initiatives derived from the Action Plan
- Banking sector's commitment beyond regulation
- Crowdfunding and participatory financing platforms
- The Digital Euro

Applied Law for Digital Transformation and Sustainability II

- Blockchain technology in the financial sector in relation to ESG aspects
  - Green financing, risk management, and reporting
  - Carbon credits
  - Accounting and reporting of greenhouse gas (GHG) emissions impact
  - Ecological certification of non-fungible tokens (NFTs)
  - Tokenized incentives and rewards

Applied Law for Platform and Distributed Services I

- Cloud services and data security
- Types of cloud computing services
  - Building services from the cloud: trusted service providers (eIDAS2 Regulation)
- Regulatory and contractual aspects of cloud storage
  - Terms and conditions: applicable versioning
  - Standards and their verification
  - Multi-jurisdictional issues and data protection: virtualization
  - Data protection in the cloud

Applied Law for Platform and Distributed Services II: DSA – Scope of Application

- Provider immunity for content: Good Samaritan clause
- Due diligence obligations
  - Universal obligations: for all hosting services, including online platforms
  - Additional obligations for online platform providers
  - Special and additional obligations for very large platforms and search engines (VLOP, VLSE)
    - Annual systemic risk assessment
    - Specific risk mitigation measures
    - Crisis response mechanisms
    - Recommendation systems
    - Additional transparency on online advertising
    - Data access
    - Verification and compliance functions
    - Independent audits
    - Transparency reports
    - Enforcement, competent authorities, and sanctions

Applied Law for Cryptography and Trusted Service Providers

- Electronic signatures: definition and properties. Types (advanced, probabilistic, blind, multiple, delegated, etc.)
- Signing a document: creation and verification of an electronic signature
- Standard signature algorithms: RSA, DSA, ECDSA
- Electronic certificates (with/without private key). Certification authorities and relational structures
- Certificate revocation
- Timestamps. Timestamp authorities. Requirements
- Trusted Service Providers
- Vulnerabilities and risk assessment

Applied Law for Cybersecurity

- Security vs. security management: ISO/IEC 27001 model
- Cybersecurity regulations and competent authorities
  - Critical infrastructures
  - NIS1 and NIS2
  - Cybersecurity Act
  - Connection to penal codes

Applied Law for Digital Identity I: Identity and Means of Identification under 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 eIDAS Regulation (eIDAS1)
  - National analog and digital identity documents
  - Signature certificates: types of signature and evidentiary value for identity

Applied Law for Digital Identity II

- Verification process and its five phases: in-person and online processes
  - Applicable regulations: Spain and EU
  - Applicable standards: Spain and EU
- Identity model under eIDAS Regulation
  - European Digital Identity Wallet (EDIW)
    - Regulation and operation
    - Interoperability with trusted third parties
    - Wallet security
  - Attribute attestations:
    - Trusted attribute attestation service providers
    - Regulation and operation
    - Similarities and differences with qualified certificate issuers and SSI/DID-based models
    - Interactions with other providers/operators
  - Trusted services and providers post-reform: changes and continuities
  - Changes in cybersecurity requirements: new scheme and requirements

Module 5 | Risks and Governance

75 Teaching hours

AI Cybersecurity

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

Model risks associated with integrating AI into current technological 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-Associated Risks, Monitoring and Supervision I

- Model Risk
- Operational Risks

AI-Associated Risks, Monitoring and Supervision II

- Compliance Risk
- Legal Risks
- Ethical Risks

Challenges and Considerations in Implementing AI for Risk Management

- 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
- Pace of innovation vs. supervision capacity

Key Roles and Their Relationship 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

- Third-Party Risk Management (TPRM) framework for AI
- Accreditation, evaluation, and monitoring criteria
- Shared governance frameworks and quality control

Vendor Management and Evaluation II

- Metrics on traceability, security, and performance
- Continuous supervision
- 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
- Catalogue of AI-related risks and controls
- Project tracking, use cases, and dashboards
- Evaluation of systems against regulatory frameworks
- Workflows

Future of Model Governance
- Model Context Protocol (MCP) and A2A
- Implications for auditing
- Explainability and traceability
- Regulatory compliance (AI Act, DORA)

Workshop on AI Risks and Governance I
- Deployment of a full AI model
- Establishment of KPIs/KRIs for monitoring
- Construction of monitoring dashboards
- Simulation of a report for the Risk Committee / Ethics Committee

Workshop on AI Risks and Governance II
- Application to Smart Due Diligence
- Cloud + MCP + Graphs
- Capability to detect errors and enable the model to self-modify prompts to complete the task

Module 6 | 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 Conmmand 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

CI/CD – Session II
- Introduction to Docker, images, and containers
- Supervised practical exercise: creating custom Docker images
- Docker Compose: basic container orchestration
- Practical deployment of a multi-container web application

Professional Cloud Architect Certification Exam

Master's Thesis Defense I

Master's Thesis Defense II

TOP Program

Module 1 | Cloud Services and Big Data
125 Teaching hours

Program Overview
- Presentation and Alignment of Objectives
- Emerging Technologies
- Business Case (ensuring coherence in technological application)

Infrastructure Fundamentals for AI Deployment
- Introduction to GIT
- Introduction to the Terminal
- Python Virtual Environments
- Cronjobs
- Environment Variables
- Basic Networking Concepts: OSI model, ports, IP protocol, etc.

Data Platforms
- DataFabric
- Snowflake
- DataSphere
- Main Data Architectures: data lakes, federated data, virtualized data, data mesh, etc.
- Data Governance Layers: schemas, lineage, taxonomy, metadata

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)
- Dataproce serverless
- Clusters
- Toubleshooting

BBig 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 ProcessingVIII
- Data lakes
- Linage, 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

CI/CD – Session III
- Core concepts of Kubernetes
- Installation and configuration of Minikube or local environment
- Deployment, scaling, and updating applications in Kubernetes
- Introduction to monitoring (Prometheus + Grafana)
- Basic implementation of monitoring in Kubernetes

CI/CD – Session IV
- Jenkins and GitHub Actions
- Practical configuration of automated pipelines
- CI/CD integration with Docker/Kubernetes
- Final project: complete pipeline with Git, Docker, Kubernetes integration, and monitoring

Other Cloud Platforms
- General introduction, key services, and comparison with Google Cloud
  - AWS (Amazon Web Services)
  - Azure (Microsoft)

Professional Big Data Engineer Certification Exam
Professional ML Engineer Certification Exam

Module 2 | Advanced and Generative Deep Learning
175 Teaching hours

Natural Language Processing I
- Corpus and Stopwords
- Word-to-Vector 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 Applications in Finance
- 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
- Re-training 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 Gaussian Mixture Models (GMM)
- Stock Quote Generation using 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 (GANs)
- Recurrent Generative Models
- Normalizing Flows

Generative Models III
- Pretraining Large Language Models (LLMs)
- Fine-Tuning and Parameter-Efficient Fine-Tuning (PEFT)
- Knowledge Distillation
- Frameworks: T5X, PAX, Others
- TPU Architectures

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

Recommender Systems
- Profile and Asset Clustering
- Recommendation Generation and Allocation Systems
- TensorFlow Recommenders
- Similarity-based Systems
- Factorization-based Systems
- Deep Learning-based Systems

Large Language Models (LLMs)
- Transformer Architectures
- BERT
- LaMDA & LLaMA2
- GPT
- YaLM
- LLaMA
- PaLM2
- Meta-Transformer
- Utilization of Pre-trained Models: APIs and Re-training
- Database-specific Question Answering (QA)

Anomaly Detection and Analysis
- Types of Anomalies: Point, Contextual, Collective
- Linear Methods: PCA, MCD, LMDD, One-class SVM
- Proximity-based 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

Graph Neural Networks (GNNs)
- Concept of Independence
- Conditional Independence
- Geometric Neural Networks

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

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

Fair Learning
- Model Adjustment Methods through Fair Learning
- Information Theory
- Dependence using Kernel Methods
- Dependence using Multivariate Gaussianization

Explainable Artificial Intelligence (XAI) I
- Reverse Engineering Methods
- Explainability in Machine Learning
- XAI in Deep Learning
- XAI Tools

Explainable Artificial Intelligence (XAI) II
- Nature of XAI Algorithms
  - Interpretability vs Explainability vs Transparency
  - Local vs Global Explainability
  - Model-specific vs Model-agnostic Explainability
  - Transparency in Models
- Challenges in Explainable Deep Learning (XDL)
- Data Visualization and Explainability
- Global Explainability
  - Components of Models (Neural Networks, Trees, SVMs)
  - Local Explainability: Permutation, LIME (Local Interpretable Model-Agnostic Explanations)
- Measuring Explainability

Explainable Artificial Intelligence (XAI) III
- Deep Learning Explainability Strategies
  - Perturbation-based Explainability
  - Gradient-based Local Explainability
  - Relevance-based Local Explainability (LRP)
- Explainability in Recurrent Neural Networks (RNNs)
  - Vanishing Gradient and Solutions

Explainable Artificial Intelligence (XAI) IV
- Transparency in RNNs
  - RNNs as State Machines and Oracles
- Workshops:
  - Adversarial Image Attacks via Explainability
  - Audio Signal Filtering via Explainability
  - Spatio-temporal Analysis of Biological Signal Processing (P300-ERPs)

Explainable Artificial Intelligence (XAI) V
- Fundamentals of Causal Inference
- Causal Estimation Techniques
- Causal Reasoning and Structural Models
- Advanced Causality and Real Applications

Causal Inference
- Causality vs. Prediction
- Experimental vs. Observational Data
- DAGs
- D-separation, Confounders/Colliders/Mediators
- Back-door/Front-door Criteria and Do(·) Notation
- From Identification to Estimation
- Guided Practice: Constructing and Validating a Case DAG

From Inference to Applied Causal AI
- Modern Estimation and Reproducible Pipelines
- DoubleML, Doubly Robust Estimators (AIPW)
- ATE/CATE, Intervals, and Diagnostics of Balance/Positivity
- Implementation with DoWhy
- SCM, Interventions, and Counterfactuals
- Abduction–Action–Prediction Algorithm
- Causal AI in Action: Policy/Uplift Learning, Connections with RL, and Applications with LLMs
- End-to-End Practice: Policy Design and Counterfactual Evaluation with DoWhy/DoubleML

Workshop: Structural Break Detection in Time Series
- Definition and Types of Regime Change (Level, Trend, Variance, and Dependence)
- Classical Deterministic Methods (Chow/Quandt-Andrews, CUSUM, Binary Segmentation, PELT)
- Supervised ML (XGBoost and Ensembles)
- Sequential Deep Learning (LSTM/Transformers) for Detection and Anticipation

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 III
- Foundational Concepts of Agents
- Building Agents in Google Cloud
- Agentic Memory
- Memory Management: LLM as Operating Systems
- Labs

Agentic AI IV
- Agent Engine and Agent Garden
- Evaluation and Improvement of Agents

- AgentOps
- Labs

Research with Google DeepMind I

- Federated Learning
- Gemini Model Family: Versions 1.0, 1.5, and 2.0 (Review of 4 Papers)
- Multimodality

Research with Google DeepMind II

- Gemma Model Family (Review of 11 Papers)
  - Models: Gemma-1, RecurrentGemma, CodeGemma, PaliGemma, ShieldGemma, DataGemma, ColPali
  - Innovations: SigLIP, Griffin, and Gemma Scope
  - LLaMA Model Family (Review of 4 Papers from Meta)
  - STaR: Bootstrapping Reasoning With Reasoning
  - Human-like Systematic Generalization Through a Meta-learning Neural Network
  - Towards Self-Assembling Artificial Neural Networks via Neural Developmental Programs

LRM – Large Reasoning Models

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

ML Ops and Project Lifecycle

- Introduction to the ML Model Lifecycle (Phases, Differences from Traditional Development, Stakeholders…)
- Data Preparation and Management (Data Ops)
- Training
- Model Deployment and Lifecycle Automation
- Model Monitoring, Maintenance, and Governance

Business Cases

- Identification, Prioritization, and Evaluation of Use Cases
- Success Factors for Use Cases
- Examples of Use Cases
  - Use Case: Audit System
  - BlinkFire Analytics

Workshop I – Explainable AI (XAI)

- How to Select the Most Appropriate XAI Technique Depending on the Case
- How to Integrate XAI into the ML/AI Model Lifecycle
- SHAP: Theory, Value Types (TreeSHAP, KernelSHAP), Visualizations
- LIME: Functioning, Advantages, and Limitations
- Partial Dependence Plots and Accumulated Local Effects
- Practical Exercise: SHAP vs. LIME Comparison
  - Finance: Automated Decision-Making (XAI and Compliance)
  - HR: AI in Recruitment (XAI and Discrimination)
  - Industry: Explainable Predictive Maintenance

Workshop II – Audit of a Credit Scoring Model (ML Explainability + Fairness)

- Objective: Understanding How to Evaluate and Govern ML Models with Direct Regulatory and Ethical Impact
- Case Study: Classification Model (e.g., XGBoost or Random Forest) Approving or Rejecting Credit Applications
- Activities:
  - Performance Evaluation: Classical Metrics + Cost of False Positives/Negatives
  - Sensitive Variable Analysis (Gender, Age, Origin): Bias Detection
  - Use of Explainability Tools: SHAP/LIME
- Key Learnings:
  - How to Balance Performance and Fairness
  - Required Documentation for Compliance with AI Act or ISO 42001
  - How to Present Results in a Comprehensible Manner to Non-Technical Audiences

Module 3 | Cybersecurity and Ethical Hacking

225 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 and countermeasure management
- 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
- Risk-based implementation of controls
- Evaluation of control effectiveness
- Relevance: CISSP (D1, D8), Security+ (D5), CASP+ (D5), CCSP (D1)

Network and Infrastructure Security I: Network Security Fundamentals

- Network security protocols
- Secure network design
- Network security devices (firewalls, IDS/IPS)
- Defense against common network attacks
- Relevance: CISSP (D4), Security+ (D3), CASP+ (D2)

Network and Infrastructure Security II: Endpoint and System Security

- Operating system hardening
- Endpoint protection

- Intrusion detection and prevention systems
- Patch and update management
- Relevance: CISSP (D3), Security+ (D2), CASP+ (D2)

Network and Infrastructure Security III: Advanced Security Architectures

- Implementation of Zero Trust architectures
- Micro-segmentation
- Software Defined Networking (SDN)
- Adaptive network architectures
- Relevance: CISSP (D3), Security+ (D3), CASP+ (D1)

Network and Infrastructure Security IV: Cryptography and PKI

- Fundamental cryptographic principles
- Cryptographic algorithms and protocols
- Public Key Infrastructure (PKI)
- Digital certificate management
- Relevance: CISSP (D3), Security+ (D6), CASP+ (D2), CCSP (D2)

Network and Infrastructure Security V: Physical and Environmental Security

- Physical access controls
- Environmental protection
- Personnel security
- CCTV and surveillance systems
- Relevance: CISSP (D7), Security+ (D3), CASP+ (D1), CCSP (D3)

Cloud and Virtualization Security I: Cloud Computing Fundamentals

- Service models (IaaS, PaaS, SaaS)
- Deployment models (public, private, hybrid)
- Reference architectures for the cloud
- Shared responsibility models
- Relevance: CISSP (D3), Security+ (D3), CASP+ (D2), CCSP (D1)

Cloud and Virtualization Security II: Cloud Architecture Security

- Designing secure cloud architectures
- Containers and microservices
- Orchestration and security
- DevSecOps in cloud environments
- Relevance: CISSP (D3), Security+ (D3), CASP+ (D2), CCSP (D3)

Cloud and Virtualization Security III: Virtualization Security

- Hypervisors and virtual machine security
- Attacks specific to virtualized environments
- Security controls in virtualization
- Container security
- Relevance: CISSP (D3), Security+ (D3), CASP+ (D2), CCSP (D3)

Cloud and Virtualization Security IV: Cloud Identity and Access Management

- IAM in cloud environments
- Single Sign-On (SSO) and identity federation
- Privilege management in the cloud
- Multi-factor authentication in cloud environments
- Relevance: CISSP (D5), Security+ (D6), CASP+ (D2), CCSP (D3)

Cloud and Virtualization Security V: Cloud Security Operations

- Monitoring and logging in cloud environments
- Cloud security automation
- Incident response in the cloud
- Cloud backup and recovery
- Relevance: CISSP (D7), Security+ (D4), CASP+ (D3), CCSP (D4)

Data and Application Security I: Data Protection

- Data classification
- Data protection controls
- Data lifecycle management
- Data Loss Prevention (DLP)
- Relevance: CISSP (D2), Security+ (D2), CASP+ (D1), CCSP (D2)

Data and Application Security II: Applied Cryptography for Data Protection

- Data encryption at rest
- Data encryption in transit
- Key management
- Tokenization and masking
- Relevance: CISSP (D2), Security+ (D6), CASP+ (D2), CCSP (D2)

Data and Application Security III: Secure Software Development

- Secure SDLC
- Application security assessment
- Static and dynamic code analysis
- DevSecOps practices
- Relevance: CISSP (D8), Security+ (D2), CASP+ (D4), CCSP (D4)

Data and Application Security IV: Web Application and API Security

- Common vulnerabilities (OWASP Top 10)
- API security
- Secure web services
- WAF and application controls
- Relevance: CISSP (D8), Security+ (D2), CASP+ (D4), CCSP (D3)

Security Operations and Incident Response I: Security Operations Management

- Security Operations Center (SOC)
- SIEM and monitoring tools
- Log and event management
- Vulnerability management
- Relevance: CISSP (D7), Security+ (D4), CASP+ (D3), CCSP (D4)

Security Operations and Incident Response II: Incident Response

- Response plans and procedures
- Containment, eradication, and recovery
- Post-incident analysis
- Incident response teams (CSIRT)
- Relevance: CISSP (D7), Security+ (D4), CASP+ (D3), CCSP (D4)

Security Operations and Incident Response III: Digital Forensics

- Evidence acquisition and preservation
- Network forensics

- System forensics
- Cloud forensics
- Relevance: CISSP (D7), Security+ (D4), CASP+ (D3), CCSP (D4)

Security Operations and Incident Response IV: Business Continuity and Disaster Recovery

- Business continuity planning
- Disaster recovery strategies
- DR/BC testing and exercises
- Continuity in cloud environments
- Relevance: CISSP (D1), Security+ (D5), CASP+ (D3), CCSP (D4)

Governance, Risk, and Compliance I: Security Governance

- Policies, standards, and procedures
- IT governance frameworks
- Security metrics and KPIs
- Security committees
- Relevance: CISSP (D1), Security+ (D5), CASP+ (D5), CCSP (D5)

Governance, Risk, and Compliance II: Advanced Risk Management

- Quantitative vs. qualitative analysis
- Risk mitigation strategies
- Third-party and supply chain risks
- Risk communication
- Relevance: CISSP (D1), Security+ (D5), CASP+ (D5), CCSP (D5)

Governance, Risk, and Compliance III: Compliance and Legal Aspects

- Key regulations (GDPR, HIPAA, PCI-DSS, etc.)
- Security audits
- Contracts and agreements (SLA, DPA)
- Data privacy
- Relevance: CISSP (D1), Security+ (D5), CASP+ (D5), CCSP (D5, D6)

Security+ Certification Preparation

- Review of the 6 Security+ domains
- Exam strategies
- Practice questions
- Mock exam

Security+ – 6 Domains:

- D1: Attacks, Threats, and Vulnerabilities
- D2: Architecture and Design
- D3: Implementation
- D4: Operations and Incident Response
- D5: Governance, Risk, and Compliance
- D6: Cryptography and PKI

CISSP Certification Preparation

- Review of the 8 CISSP domains
- Exam strategies
- Practice questions
- Mock exam

CISSP – 8 Domains:

- D1: Security and Risk Management
- D2: Asset Security
- D3: Security Architecture and Engineering
- D4: Communication and Network Security
- D5: Identity and Access Management
- D6: Security Assessment and Testing
- D7: Security Operations
- D8: Software Development Security

CASP+ Certification Preparation

- Review of the 5 CASP+ domains
- Exam strategies
- Practice questions
- Mock exam

CASP+ – 5 Domains:

- D1: Security Architecture
- D2: Security Operations and Infrastructure
- D3: Security Integration of Systems and Applications
- D4: Incident Response and Risk Management
- D5: Governance, Risk, and Compliance

CCSP Certification Preparation

- Review of the 6 CCSP domains
- Exam strategies
- Practice questions
- Mock exam

CCSP – 6 Domains:

- D1: Cloud Concepts, Architecture, and Design
- D2: Cloud Data Security
- D3: Cloud Platform and Infrastructure Security
- D4: Cloud Application Security
- D5: Cloud Security Operations
- D6: Legal, Risk, and Compliance

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

Forensic Analysis I: Fundamentals of Digital Forensic Analysis
- Principles and Objectives of Digital Forensics
- Legal Framework and Chain of Custody
- Types of Digital Evidence and Their Admissibility
- Lifecycle of Forensic Analysis

Forensic Analysis II: Acquisition and Preservation of Evidence
- Incident Response Procedures
- Data Acquisition Techniques (Forensic Imaging)
- Tools for Capturing Volatile and Non-Volatile Evidence
- Integrity Verification and Process Documentation

Forensic Analysis III: File Systems
- Structure of File Systems (NTFS, FAT, ext4)
- Recovery of Deleted Files
- Metadata and Timestamp Analysis
- File Carving and Data Fragment Recovery

Forensic Analysis IV: Windows Systems
- Windows Registry and Its Forensic Artifacts
- Analysis of Logs and Security Events
- Web Browsing and Communication Artifacts
- Correlation of Evidence in Windows Systems

Forensic Analysis V: Unix/Linux Systems
- Directory Structure and Permissions
- Log Analysis and Auditing
- Forensic Artifacts in Linux Environments
- Memory Analysis in Unix Systems

Forensic Analysis VI: Memory and Process Analysis
- RAM Capture
- Analysis of Processes, Connections, and Sockets
- Detection of Rootkits and Malware in Memory
- Memory Analysis Tools (Volatility)

Forensic Analysis VII: Mobile Devices and Network Analysis
- Forensic Acquisition of iOS and Android Devices
- Application and Storage Analysis
- Network Traffic and Packet Capture Analysis
- Correlation Between Network and System Evidence

Forensic Analysis VIII: Incident Reconstruction and Reporting
- Timeline Techniques and Event Reconstruction
- Causality and Attribution Analysis
- Preparation of Expert Forensic Reports
- Presentation of Evidence and Expert Testimony

Module 4 | 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

Module 5 | Launching Your Own Startup
30 Teaching hours

Business Idea Definition and Validation

- Development of a Solid Value Proposition
- Analysis of Competitive Advantage: Is It Sustainable Over Time?
- Definition of Requirements and Project Coherence

Product Prototyping and Validation

- Development of a Minimum Viable Product (MVP)
- Value Chain Analysis

Market Entry and Competitive Strategy

- Development of a Go-to-Market Strategy
- Competitive Analysis
- Pricing Strategy
- Marketing Strategy

Financing and Legal Considerations

- Cash Flow Estimation
- Securing Financing
- Legal Aspects of the Project

Presentation of the Project to Startup Accelerators

Presentation of the Project to the Business Angels Association

Master's Thesis Defense I

Master's Thesis Defense II

AthenAI

5

Certifications

You will be able to obtain up to ***eight certifications***, all while studying this Master's program.

Security+ D5 Certification (CompTIA Security+)

The **Security+ certification**, issued by **CompTIA**, is designed to validate the **foundational cybersecurity skills** required to identify, mitigate, and respond to common threats. It is ideal for technical professionals seeking to establish a solid foundation in IT security and is widely recognized across corporate, government, and financial sectors.

This certification demonstrates that professionals are capable of:

- Effectively detecting and responding to security incidents
- Applying cybersecurity principles to networks, devices, users, and applications
- Implementing security controls in accordance with organizational policies and regulations

Certificate Content

Security Fundamentals:

- Principles of Confidentiality, Integrity, and Availability (CIA)
- Basic risk management and security controls

Threats, Vulnerabilities, and Attacks:

- Types of threats (malware, phishing, ransomware, etc.)
- Vulnerability analysis and mitigation

Security Architecture and Design:

- Secure network design
- Security in hybrid and cloud environments

Identity and Access Management (IAM):

- Authentication methods and access control
- Applying security policies to users and devices

Risk Management and Compliance:

- Policies, procedures, and relevant regulations (e.g., GDPR, ISO/IEC 27001)
- Physical and environmental security

Security Operations:

- Threat detection, incident response, and business continuity
- Security monitoring and log management

Benefits for Students:

- Well-suited for technical profiles in early or mid-career stages
- Globally recognized accreditation, widely used in tech companies, financial services, and public institutions
- Practical application focused on real operational tasks, from network protection to incident management

To obtain this certification, candidates must pass a **90-minute exam** consisting of up to **90 multiple-choice and interactive performance-based questions (PBQs)**. The exam can be taken remotely under supervision or at authorized testing centers.
The **exam fee is USD 392**, which must be paid directly to CompTIA by the student.

Prerequisites: None are required, although general IT knowledge is recommended.

CASP+ D5 Certification (CompTIA Advanced Security Practitioner)

The **CASP+ certification**, issued by **CompTIA**, validates **advanced cybersecurity skills** for professionals who design, implement, and manage complex security solutions in large organizations. Unlike other management-focused certifications, CASP+ emphasizes **expert-level technical skills**, making it a key credential for security architects, senior engineers, and specialists in critical environments.

This certification demonstrates that professionals can:

- Design complex, integrated security architectures in enterprise environments
- Implement cryptographic, network, and resilience solutions against advanced threats
- Assess risks, manage vulnerabilities, and ensure regulatory compliance in distributed systems

Certificate Content

Enterprise Security:

- Evaluation of technical and business requirements for security solutions
- Design of security strategies aligned with organizational lifecycle

Risk Management and Compliance:

- Assessment and mitigation of advanced risks
- Integration of regulatory frameworks (e.g., NIST, ISO, GDPR) into security architectures

Security Architecture:

- Designing secure architectures in on-premise, cloud, and hybrid environments
- Applying advanced techniques in segmentation, virtualization, and access control

Security Operations:

- Managing complex security events and incidents
- Automating responses with orchestration tools and forensic analysis

Cryptography and Identity Management:

- Selecting and implementing cryptographic algorithms
- Integrating IAM solutions, MFA, and identity federation

Benefits for Students:

- Expert technical profile: Recommended for senior professionals seeking deep technical and tactical cybersecurity expertise
- Advanced operational focus: Provides practical experience in real-world environments, especially in critical sectors such as finance, defense, and telecommunications
- Professional recognition: Highly valued by employers requiring technical skills beyond standard security management

To obtain this certification, candidates must pass a **165-minute exam** consisting of up to **90 questions** that combine multiple-choice and performance-based simulations (PBQs). The exam can be taken **in-person or remotely under supervision**.
The **exam fee is USD 494**, which must be paid directly to CompTIA by the student.

Prerequisites: None are mandatory, but at least **5 years of experience in cybersecurity**, particularly in technical or architecture roles, is recommended.

CISSP D1 Certification (Certified Information Systems Security Professional)

The **CISSP certification**, issued by **(ISC)²**, is designed to validate **advanced knowledge and skills** in designing, implementing, and managing cybersecurity programs. It is a globally recognized credential, highly valued by organizations in the financial, technology, and government sectors, and is intended for professionals seeking **strategic roles in protecting critical information assets**.

This certification demonstrates that professionals can:

- Design and manage comprehensive and resilient security architectures
- Identify and mitigate cybersecurity risks in complex organizations
- Align security policies and controls with business objectives and regulatory requirements

Certificate Content

Security and Risk Management:

- Risk assessment and impact analysis
- Governance, compliance, and security policies

Asset Security:

- Classification and lifecycle management of information
- Protection of privacy and intellectual property

Security Architecture and Design:

- Designing secure architectures
- Secure design principles for cloud, on-premise, and hybrid environments

Network and Communication Security:

- Secure network protocols
- Detection, prevention, and response to threats in complex networks

Identity and Access Management (IAM):

- Authentication, authorization, and federation systems
- Implementation of role-based access control policies

Security Assessment and Testing:

- Audits, penetration testing, and vulnerability analysis

Security Operations:

- Event monitoring, incident response, and business continuity

Software Development Security:

- Secure software development lifecycle (SDLC) principles
- Vulnerability management in applications

Benefits for Students:

- Certification issued by (ISC)², recognized as a standard of excellence in cybersecurity
- Highly valued in regulated sectors such as banking, insurance, defense, and consulting
- Equips professionals to lead cybersecurity programs and manage organizational risk at scale

To obtain this certification, candidates must pass a **4-hour exam** consisting of **100–150 adaptive (CAT) multiple-choice questions**, taken at authorized testing centers or remotely under supervision. The **exam fee is USD 749**, which must be paid directly to **(ISC)²** by the student. **Prerequisites:** Candidates must have **5 years of professional experience** in at least **2 of the 8 CISSP CBK domains**. Those lacking the required experience can obtain the status of **"Associate of (ISC)²"** until they complete the necessary years.

CCSP D5 Certification (Certified Cloud Security Professional)

The **CCSP certification**, issued by **(ISC)²**, is designed to validate **advanced competencies in cloud security**. It is an internationally recognized credential, ideal for professionals who **manage, design, or audit cloud security architectures and operations**. The certification combines a technical and strategic approach, integrating legal, regulatory, and data governance aspects.

This certification demonstrates that professionals can:

- Design and implement secure architectures in public, private, and hybrid cloud environments
- Assess risks, apply technical controls, and ensure regulatory compliance in the cloud
- Efficiently manage identities, data, and security operations in distributed environments

Certificate Content

Cloud Architectural Concepts:

- Delivery models (IaaS, PaaS, SaaS)
- Principles of secure cloud architecture

Governance, Risk, and Compliance:

- Risk assessment in cloud environments
- Compliance with regulatory frameworks (GDPR, ISO/IEC 27017, PCI DSS, etc.)

Cloud Infrastructure Security:

- Designing resilient architectures
- Network controls, virtualization, and multi-cloud environment protection

Data Security:

- Encryption in transit and at rest
- Information lifecycle management and classification

Identity and Access Management (IAM):

- Federations, multi-factor authentication (MFA), and granular access control

Cloud Security Operations:

- Monitoring, incident response, and business continuity
- Automation and DevSecOps in cloud environments

Benefits for Students:

- High specialization in cloud security, ideal for cloud architects, compliance officers, and cloud auditors
- Certification backed by (ISC)² and aligned with international best practices
- Highly valued in banking, insurance, fintech, and public administration due to its regulatory and technical focus

To obtain this certification, candidates must pass a **4-hour exam** consisting of **125 multiple-choice questions**, taken at authorized testing centers or remotely under supervision.

The **exam fee is USD 599**, which must be paid directly to **(ISC)²** by the student.

Prerequisites: Candidates must have at least **5 years of professional experience in information security**, including **1 year in one of the CCSP-defined cloud security domains**. Those who have not yet met the requirements can obtain the status of **"Associate of (ISC)²"** until they complete the necessary experience.

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 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.

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.

CAIO Certification (Chief Artificial Intelligence Officer)

The **Chief Artificial Intelligence Officer (CAIO) certification**, issued by **AthenAI Institute of Technology**, accredits that the student has acquired the strategic, technical, and organizational competencies necessary to lead the transformation of companies through Artificial Intelligence.

Esta certificación está diseñada para validar que los profesionales son capaces de:

- Designing and driving global Artificial Intelligence strategies in complex business environments.
- Coordinating interdisciplinary teams of data, technology, and business with a results-oriented approach.
- Ensuring ethical, regulatory, and security compliance in large-scale AI projects.
- Integrating AI as a business enabler, aligning technical capabilities with corporate objectives.

Certificate Content

Strategic Leadership in AI

- Data and Artificial Intelligence governance.
- Designing AI strategies aligned with business plans.
- Developing roadmaps for responsible AI adoption.

Technology and Innovation Management

- Evaluation and selection of AI tools and vendors.
- Design and implementation of scalable architectures (cloud, hybrid, on-premise).
- Integration of AI into core business processes.

Risk, Ethics, and Compliance

- Application of international regulatory frameworks (EU AI Act, ISO/IEC, NIST, etc.).
- Assessment of operational, reputational, and regulatory risks.
- Promotion of an organizational culture focused on ethical and sustainable AI.

Executive Capabilities and Global Vision

- Effective communication with the executive board.
- Cultural transformation for data-driven environments.
- Impact analysis, KPIs, and AI return on investment.

Benefits for Students

- Institutional Recognition: Proprietary certification backed by AthenAI Institute of Technology.
- Unique Professional Profile: Distinct accreditation to lead AI across any sector.
- Access to an Exclusive Network: Connect with professionals, experts, and innovative companies.
- Real-World Job Preparation: Applied, up-to-date training aligned with business needs.
- Design, Implementation, and Deployment of AI-Based Tools

To obtain this certification, students must successfully complete all master's program practical exercises as well as the final master's project. The CAIO certification is included in the tuition of the master's program.

Startup Launch Program

The Startup Launch Program is designed for students and emerging entrepreneurs seeking to transform their innovative ideas into real businesses. Through a hands-on approach, participants develop the skills necessary for idea validation, creation of minimum viable products, market strategy design, and securing funding.

Program Structure and Content

Definition and Validation of the Business Idea

- Development of a solid value proposition
- Analysis of the sustainability of competitive advantage
- Identification of needs and evaluation of project coherence

Prototyping and Product Validation

- Creation of a minimum viable product (MVP)
- Value chain analysis to maximize operational efficiency

Development of a Market Entry Strategy

- Comprehensive competitor analysis
- Determination of optimal pricing for the product or service
- Design of an effective marketing strategy

Funding and Legal Aspects

- Cash flow estimation and financial analysis
- Strategies for obtaining funding (investors, loans, grants)
- Legal requirements for entrepreneurship

Project Presentation to Investors

- Presenting proposals to startup accelerators
- Presenting proposals to Business Angel associations

This program provides a comprehensive skill set for startup creation, from idea conception to funding and market entry.

Students will not only acquire theoretical knowledge but also develop practical competencies and have the opportunity to present their projects to real startup accelerators and Business Angels.

AthenAI

Career Opportunities

Upon completing this Master's program, you will become a ***Chief Artificial Intelligence Officer***, one of the most sought-after and highly compensated roles in both the public and private sectors (finance, insurance, healthcare, energy, telecommunications, etc.).

Chief Artificial Intelligence Officer (CAIO)

Upon completing the master's program, you will possess the knowledge to assume the role of Chief Artificial Intelligence Officer (CAIO) in virtually any sector (technology, finance, healthcare, education, government, etc.). You will lead the strategy, development, and adoption of AI across the organization, bridging the current gap between technological advancements and organizational culture.

Although the master's program is specifically designed to prepare future Chief Artificial Intelligence Officers, the skills and knowledge acquired also enable access to, or advancement within, other Level-C roles (related to technology, data, regulatory compliance, and innovation), providing an innovative perspective based on the application of Artificial Intelligence.

Other Professional Paths

CDO – Chief Data Officer
Leads the organization's data strategy, ensuring governance, quality, integration, and effective use in AI and advanced analytics initiatives.

CRO – Chief Risk Officer
Evaluates and manages technological, legal, and ethical risks associated with AI, integrating them into the organization's overall corporate risk management framework.

CTO – Chief Technology Officer
Oversees strategic technology decisions, including the adoption of cloud infrastructures, AI, and other key emerging technologies essential for business competitiveness.

CIO – Chief Information Officer
Ensures that information systems align with the business strategy and are prepared to efficiently and scalably integrate AI solutions.

CISO – Chief Information Security Officer
Protects the organization's digital assets by incorporating cybersecurity in AI environments and ensuring the secure management of the data lifecycle.

CCO – Chief Compliance Officer
Responsible for compliance with regulations related to AI, data privacy, algorithmic auditing, and responsible governance of intelligent systems.

CDO (Digital) – Chief Digital Officer
Leads AI-driven digital transformation initiatives, integrating new technologies into the organization's value proposition, operations, and culture.

AI Compliance and Risk Officer
Specialist in designing and implementing compliance and risk management frameworks specific to AI-based projects and systems.

Head of AI Governance
Designs and implements policies, processes, and governance structures to ensure ethical, safe, and effective use of AI within the organization.

Digital Transformation Specialist with AI
Advises on and executes digital transformation plans where AI plays a central role, from process optimization to the personalization of products and services.

AI Strategic Advisor
Helps organizations identify business opportunities through AI, define technology roadmaps, and align investments with strategic objectives.

Data & AI Strategist
A hybrid professional bridging data and Artificial Intelligence, capable of connecting insights and algorithms with high-impact business decisions.

Founder of an AI Startup
Launches your own venture with Artificial Intelligence as the engine of innovation, leveraging both the knowledge and network gained during your time at the school.

Comparison of Technological Profiles

Content	CAIO	CDO	CRO	CTO	CIO	CISO	CCO	Essential Level-C	Top Level-C
Applied Artificial Intelligence	✓			✓				✓	✓
Programming and MLOps	✓			✓				✓	✓
Data Science and Advanced Analytics	✓	✓						✓	✓
Technology Architecture / Systems	✓	✓		✓	✓	✓		✓	✓
Cloud and Distributed Services	✓	✓		✓	✓	✓		✓	✓
Technical and Strategic Cybersecurity	✓	✓	✓	✓	✓	✓		✓	✓
Data Governance		✓			✓	✓			✓
Corporate Risk Management			✓			✓	✓		✓
Regulatory Compliance (AI Act, GDPR)	✓	✓	✓			✓	✓	✓	✓
Technology Ethics and Transparency	✓	✓	✓			✓	✓	✓	✓
Strategic Leadership and Transformation	✓	✓	✓	✓	✓	✓	✓	✓	✓
Technological Innovation and Disruption	✓			✓				✓	✓
Product Design and User Experience				✓					✓
Digital Culture and Change Management	✓	✓	✓	✓	✓	✓	✓	✓	✓

Toolbox Upon Completion

Artificial Intelligence

Genetic | Swarm | Fuzzy Logic

ML

Machine Learning (ML)
- Frameworks: TensorFlow, PyTorch, Keras
- Model evaluation
- Data visualization
- Clustering algorithms

DL

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

Applied Technology Law and Regulatory Frameworks
- Artificial Intelligence
- Digital Transformation and Sustainability
- Platform and Distributed Services
- Cybersecurity
- Digital Identity
- Data governance

Governance and Strategic Fundamentals
- Business Strategy
- AI Project Management
- AI Governance Framework
- Advanced Management and Governance of AI-Related Risks

Risk Management
- Advanced Risk Management
- AI-Associated 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

Cybersecurity
- Advanced Security and Cybersecurity Fundamentals

Programming Language
Python

Cloud Architecture
AWS
Azure
Google Cloud

Containers
Docker
Kubernetes

Databases (DB)
- NoSQL
- SQL
- MongoDB

ETL Pipeline Development and Deployment
ETL

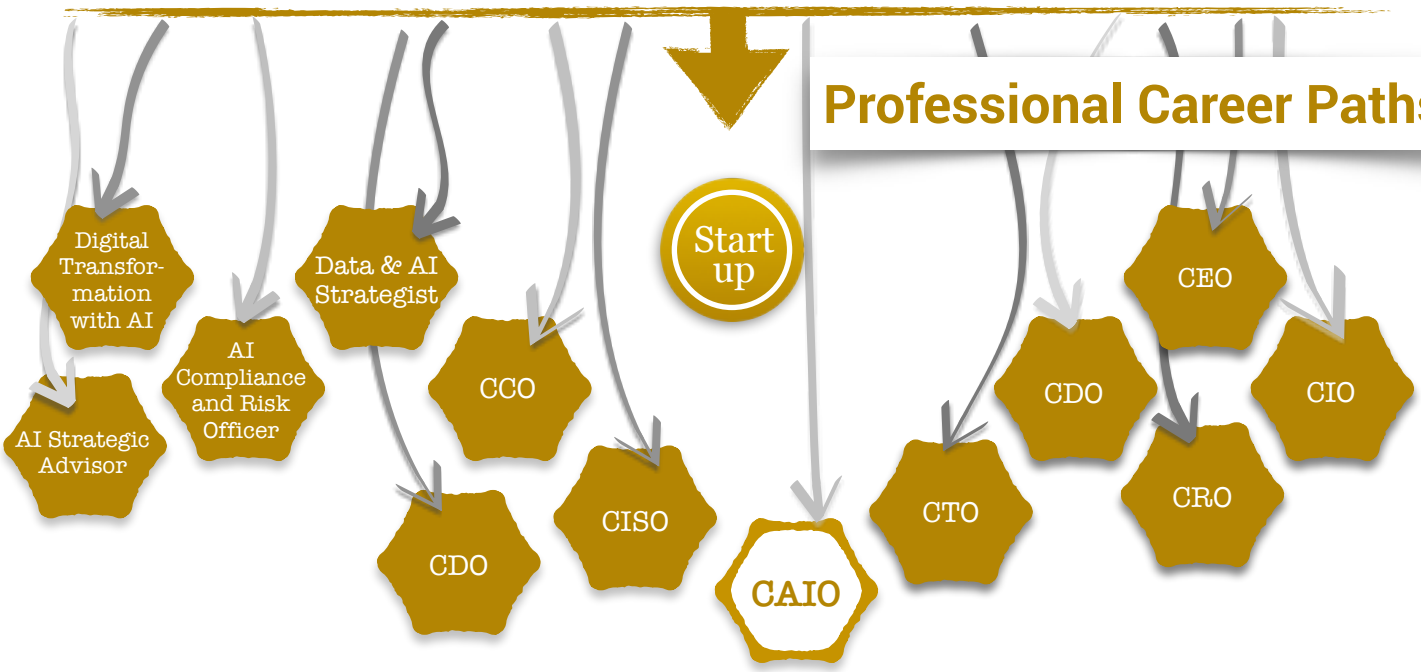
Big Data
Spark

API Development
FastAPI

DevOps
CI/CD
CI/CD con GitLab Runners

You Will Achieve:
CCSP (ISC2)
CISSP (ISC2)
CompTIA Security+
CompTIA CASP+
Google Cloud Certified – Professional Machine Learning Engineer
Google Cloud Certified – Professional Cloud Architect
Google Cloud Certified – Professional Data Engineer

Professional Career Paths



AthenAI

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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.

Profesor		Especialidad	Formación	Puesto actual
	Carlos Muñoz Ferrandis	Law	- Bachelor's Degree in Law - Master's Degree in Legal Practice - Master's Degree in Intellectual Property and Information Technology Law - Doctor of Philosophy and PhD Candidate in Law	Co-founder & COO **Alinia AI**
	Eduardo Sáenz de Cabezón	Artificial Intelligence	- Bachelor's Degree in Mathematics - PhD in Mathematics	Full Professor **University of La Rioja** Science communicator and TV presenter
	Franco Dante Albareti	Quantum Computing	- Bachelor's in Physics (First in Class) - Master's in Theoretical Physics, Cosmology and Elementary Particles - PhD in Theoretical Physics and Spacetime Curves (First in Class) - Master's in Artificial Intelligence Applied to Financial Markets (mIAX)	Senior Software Engineer **Affirm**
	Ginés Carrascal de las Heras	Quantum Computing	- Bachelor's in Physics, Optics and Electronics - Master's in Spectral Laser Microanalysis	Quantum Computational Scientist **IBM Quantum**
	Gonzalo Navarro Ruiz	Law	- Bachelor's in Law - Bachelor's in Business Administration - Master's in Corporate Legal Advisory (First in Class) - PhD in Corporate Law – Securities Market (Summa Cum Laude, Unanimous) - Executive Master of Business Administration (EMBA)	Partner of Financial Regulation & Capital Markets **Crowe Spain**
	Guillermo Meléndez Alonso	Artificial Intelligence	- Diploma in Business Studies (First in Class) - Bachelor's in Business Administration (First in Class) - Master's in Auditing - Master's in Quantitative Finance - Master's in Stock Market and Alternative Investments - Master's in Data Science and Big Data (First in Class) - Master's in Deep Learning (First in Class)	CEO **AthenAI**
	Javier Cañadillas	Big Data	- Aerospace Engineer - Master's Degree in Computer Science - Science, Industrial Physics, Artificial Intelligence, and Electronics	EMEA Application Modernization Solution Lead **Google**
	Jesús Mardomingo	Law	- Bachelor's in Law	Partner **Andersen**
	Jesús Sanz del Real	Artificial Intelligence + Finance	- Bachelor's in Law - Bachelor's in Business Administration and Management - Master's in Artificial Intelligence Applied to Financial Markets (mIAX) - CFA Level II	Associate Team Leader & Data Scientist **Oliver Wyman**

Profesor		Especialidad	Formación	Puesto actual
	Jose Antonio Esteban Sánchez	Big Data	- Technical Systems Engineer	Chief Executive Officer (CEO) **IronIA** Investment Fund Manager Specialized in AI
	Jose Zamora	Artificial Intelligence + Big Data	- Double Degree in Computer Engineering and Hardware - Master's in Computer Vision - Master's in Digital Intelligence - MBA	Director of AI, GenAI and MLOps
	Luis Fernando Lago Fernández	Artificial Intelligence + Mathematics	- Bachelor's in Physics - Bachelor's in Mathematics - PhD in Computer Science	Department of Biological Neurocomputation Polytechnic **University of Madrid**
	Manuel Sánchez Montañés Isla	Artificial Intelligence	- Bachelor's in Physics - PhD in Computer Engineering	Researcher Autonomous **University of Madrid**
	Miguel García Cordo	Artificial Intelligence – **Academic Management**	- Master's in Artificial Intelligence Applied to Financial Markets (mIAX) - Master's in Artificial Intelligence (Artificial Intelligence Institute) - ISO 42001 AI Management Leader Certification - ISO 38507 AI Governance Leader Certification	Chief Risk Officer (CRO) **Inversis**
	Minerva Rodríguez Cabrera	Artificial Intelligence	- Master's in Artificial Intelligence Applied to Financial Markets (mIAX)	Chief Operations Officer (COO) **AthenAI**
	Rafael Sánchez	Artificial Intelligence + Big Data	- Bachelor's in Telecommunications - PhD in Engineering and Telecommunications	Manager, Generative AI / ML, Southern Europe and Middle East **Google**
	Raquel Hernández Falcón	Artificial Intelligence + Finance – **Academic Management**	- Bachelor's in Mathematics, Statistics, and Research - Master's in Artificial Intelligence Applied to Financial Markets (mIAX) - Master's in Quantitative Finance	Credit Trader **CecaBank**
	Ricardo Estefanescu Abad	Quantum Computing	- Bachelor's Degree in Computer Engineering - Professor of Quantum Computing, Francisco de Vitoria University - IBM Senior Quantum Ambassador	CTO **Puffin Security**

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General Information

General Information

Duration

Full program equivalent **127 ECTS**

Level C Essential

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

Start Date		*End Date*
October 2nd, 2026	→	September 28th, 2027

Top Level C

- Equivalent to 73 ECTS
- 610 teaching hours
- 1.830 teaching + study hours
- 15 months

Start Date		*End Date*
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.

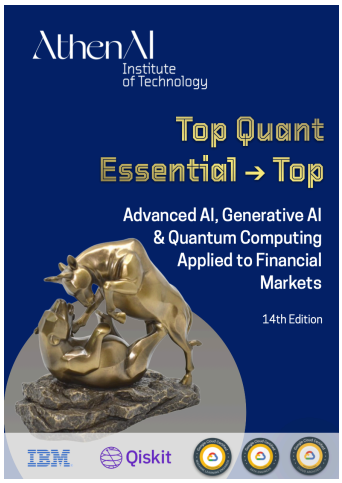
Price

The price of the **Level C Essential** program is 11.000 €

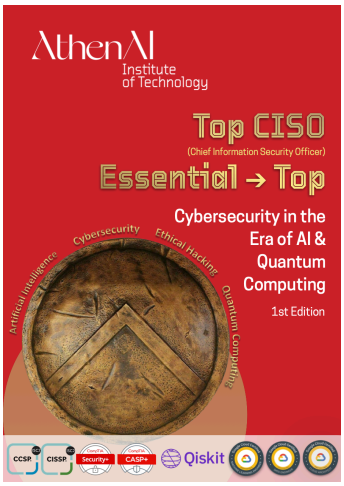
The price of the **Top Level C** program is 15.000 €

The price of 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 Quant*** Master's program, priced at **€27,500**, 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 CAIOs. Its purpose was to teach how to combine Advanced Artificial Intelligence and data governance to lead AI departments.

The official name of the Master's program was:

"Emerging Tech & Digital Executive Leadership".

The students referred to it as...

Top Level-C