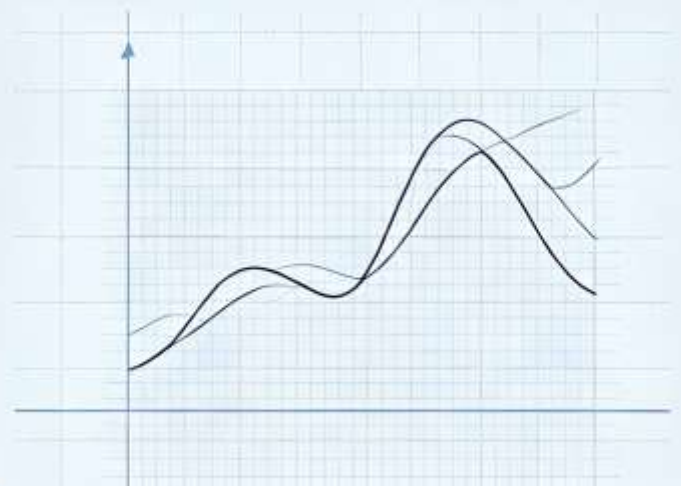
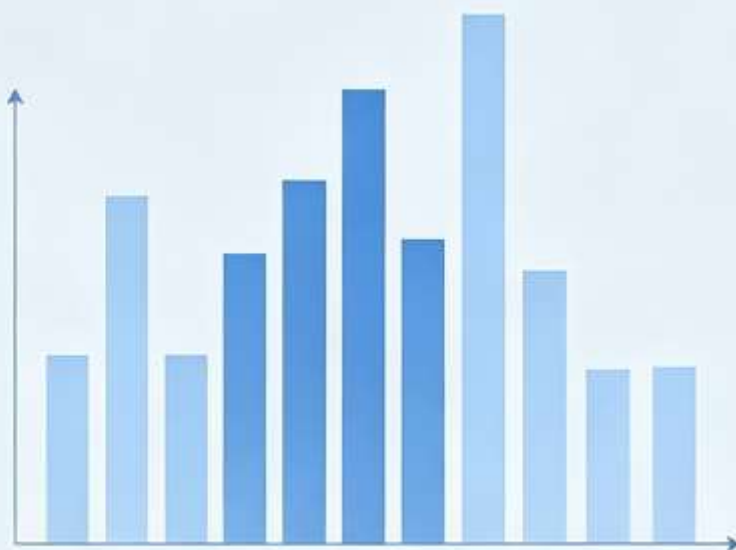


Certified Fintech Analyst Institute

CFTA CFTA Examination Curriculum

Certified FinTech Analyst Syllabus
2026 Program Edition



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Foreword

This Examination Curriculum has been prepared by the Academic Committee of the Certified Fintech Analyst Institute (CFTA) for the 2027 CFTA certification examinations.

The CFTA certification program comprises three distinct levels, and candidates must pass each level sequentially. This curriculum is designed to provide candidates with clear examination guidance and may also serve as a reference for training institutions developing course offerings. All recommended textbooks are published by leading U.S. publishers, enabling candidates to pursue systematic self-study.

The content of some cutting-edge technology courses updates faster than traditional publishing cycles, and relevant modules will be supplemented with teaching materials from global top academic conference papers, open-source project documents, and industry white papers.

CFTA Examination Rules

This section applies to all candidates registering for CFTA Levels I, II, and III. Please read the following information carefully to ensure successful registration and examination participation.

I. Examination Schedule and Session Arrangements

CFTA examinations are administered **four times annually**, on the **third weekend of March, June, September, and December**. The specific schedule for each level is as follows:

Level	Examination Date	Specific Time	Duration
Level I	Saturday	9:00 AM – 12:00 PM	3 hours
Level II	Saturday	2:00 PM – 5:00 PM	3 hours
Level III	Sunday	9:00 AM – 12:00 PM	3 hours

Special Notes:

- All session times are based on the **time zone automatically assigned according to the candidate's nationality** (see Section IV: Examination Time Zone Assignment)

Rules).

- Candidates are required to log in to the online examination system **30 minutes** prior to the start of the examination for identity verification and environment checks. Candidates who have not logged in 15 minutes after the start time will be marked as absent.

II. Registration and Level Progression Rules

2.1 Registration Eligibility

Level	Registration Eligibility
Level I	No prerequisites. Open to any individual interested in the field of fintech.
Level II	Must have passed Level I to register for Level II.
Level III	Must have passed Level II to register for Level III.

2.2 Level Progression Requirements

1. **Sequential Progression Principle:** CFTA certification strictly enforces a sequential progression policy. Candidates must pass the current level before becoming eligible to register for the subsequent level.
2. **Score Validity:** Passed level scores remain **valid indefinitely**. Candidates may choose to take subsequent level examinations at their own pace, without time restrictions.
3. **Level Skipping Prohibited:** Level skipping is not permitted under any circumstances (e.g., registering for Level II without having passed Level I).

2.3 Complimentary Retake Policy

Candidates who fail a level examination are entitled to one complimentary retake opportunity for that level, subject to the following rules:

- The complimentary retake is **automatically scheduled** for the **next available examination window** (the third weekend of the next March, June, September, or December following the failed attempt);
- Candidates are **not required to re-register** and **no fees will be charged**—CFTA will automatically enroll the candidate for the upcoming retake session;
- The complimentary retake opportunity is **limited to one per level**. If the retake is also unsuccessful, subsequent attempts require standard registration and payment of examination fees;

- The complimentary retake opportunity is **non-transferable and non-deferrable**.

Failure to appear for the scheduled retake constitutes forfeiture of this opportunity.

2.4 Registration Window

Examination Month	Registration Opens	Registration Closes
March Examination	December 11 of prior year	December 10 at 11:59 PM
June Examination	March 11	June 10 at 11:59 PM
September Examination	June 11	September 10 at 11:59 PM
December Examination	September 11	December 10 at 11:59 PM

Candidates are encouraged to register early, as last-minute registration may be delayed due to system congestion.

III. Deferral Policy

3.1 Deferral Application Eligibility

Candidates may apply for a deferral if they are unable to attend a scheduled examination due to the following reasons:

- **Personal health conditions:** sudden illness, physical discomfort, etc.;
- **Work-related reasons:** unexpected overtime, emergency business travel, project deadline conflicts, etc.;
- **Family reasons:** urgent family matters, need to care for relatives, etc.;
- **Force majeure:** natural disasters, government-mandated restrictions, major public events, etc.;
- **Other legitimate reasons** recognized by the CFTA Testing Center.

Important Note: CFTA fully understands that candidates may face unexpected circumstances in their professional and personal lives. Operating under a principle of compassionate administration, **CFTA will generally approve deferral applications as long as the reason is adequately explained and substantively reasonable**. Candidates are **not required to submit medical certificates, employment verification, or other supporting documentation**.

3.2 Deferral Application Process

1. Candidates must send a deferral application email to exam@cftainstitute.org **prior to the examination date** (no later than the start of the examination day);
2. Email subject line format: "**Deferral Request — [Candidate Name] — [Level] —**

[Examination Date]";

3. The email body must include:
 - Candidate's full name
 - Level registered for
 - Original examination date
 - **Reason for deferral (brief description is sufficient)**

3.3 Deferral Approval and Rescheduling

- The CFTA Testing Center will respond with the approval decision via email within **3 business days**;
- Upon **approval of the deferral**, the candidate will be **automatically scheduled** for the **next available examination window** at the same level, **without the need to re-register or pay any fees**;
- Each candidate is entitled to a **maximum of one deferral per level**;
- Candidates who fail to appear for the examination without having submitted a deferral application will forfeit that examination attempt; however, they **remain eligible for the complimentary retake opportunity** (see Section II.2.3 "Complimentary Retake Policy").

Coordination with the Complimentary Retake Policy

To help candidates clearly understand the distinction and coordination between the two policies, the following comparison is provided:

Scenario	Advance Application Required	Consumes Complimentary Retake Opportunity	Result
Took the examination but failed	No	Yes (consumes retake)	Automatically scheduled for next retake
Deferral approved and did not take the examination	Yes (before exam date)	No (does not consume)	Automatically scheduled for next available session
Did not apply for deferral and did	No	Yes (consumes retake)	Automatically scheduled for next

Scenario	Advance Application Required	Consumes Complimentary Retake Opportunity	Result
not appear			retake

Candidate Tip: If you are unable to take the examination for any reason, **applying for a deferral is strongly recommended**, as this preserves your complimentary retake opportunity for future use.

IV. Examination Time Zone Assignment Rules

4.1 Default Time Zone Assignment

CFTA examinations determines the candidate's country and city based on their historical login information, then automatically assigns the exam time zone. A confirmation email will be sent to the candidate one month before the exam. **All candidates in the same time zone and at the same level must start the exam at the same time.**

4.2 Time Zone Adjustment Requests

Candidates may request a time zone adjustment if their current work, study, or residence location creates a persistent time zone conflict with their nationality-based assignment:

- Requests must be submitted via email to exam@cftainstitute.org **at least one week prior** to the examination date;
- Email subject line format: **"Time Zone Adjustment Request — [Candidate Name] — [Level] — [Examination Date]"**;
- The email body must include the candidate's full name, level registered for, the **country and city where you will be during the exam**, and the requested time zone;
- CFTA will respond with the approval decision within **3 business days**, based on the distribution of all candidates registered for that examination window, and will notify the candidate of the adjusted local start time;
- Upon approval, the candidate will receive an updated confirmation email—candidates must strictly follow the time indicated in this confirmation.

V. Examination Format and Question Types

5.1 Examination Format

CFTA Levels I, II, and III are all administered as **online examinations** in English, with online proctoring and technical support provided by **ATA (Advanced Testing Authority)**, CFTA's

authorized examination services partner.

5.2 Question Types and Weight by Level

Level	Question Type Composition	Total Score	Passing Score
Level I	Multiple Choice (60%) + Applied Questions including Programming (40%)	100 points	70 points
Level II	Multiple Choice (40%) + Applied Questions including Programming (60%)	100 points	70 points
Level III	Multiple Choice (40%) + Applied Questions including Programming and Case Analysis (60%)	100 points	70 points

5.3 Description of Question Types

Question Type	Description
Multiple Choice	Four-option single-answer multiple-choice questions, 1 point each, no penalty for incorrect answers. Assesses foundational concepts and knowledge retention.
Applied Questions	Includes computational problems, short-answer questions, code completion, code debugging, and case analysis. Partial credit is awarded based on steps or key points.
Programming Questions	Designed in the format of "core code completion + code debugging + output interpretation"—candidates are not required to write complete programs from scratch. Emphasizes the ability to translate financial business logic into code.

VI. Online Examination Technical Support and Contact

6.1 Examination Platform

CFTA online examinations are administered through CFTA's authorized partner, **ATA**

(**Advanced Testing Authority**) , which provides comprehensive technical support and online proctoring services. ATA is a global leader in computer-based testing services with extensive remote proctoring experience.

6.2 Technical Support During the Examination

- **Technical Issues:** In the event of network interruptions, system errors, audio/video anomalies, or other technical problems, candidates may communicate with ATA technical support staff in real-time through the **Live Chat** function available on the examination platform interface;
- **Proctoring Communication:** Proctors will communicate with candidates via the system's text chat or voice functions—please keep your microphone enabled and monitor on-screen notifications;
- **Backup Contact:** If the Live Chat function is unavailable, candidates may use the backup contact telephone number provided in the examination confirmation email to reach the ATA technical support team;
- **Technical Incident Recording:** In the event that examination delivery is interrupted due to ATA system-side technical failures, ATA will issue a technical incident report, and the CFTA Testing Center will determine whether a rescheduled examination is warranted.

6.3 Hardware and Network Requirements

Item	Minimum Requirement
Computer	Desktop or laptop computer (tablets and smartphones are not permitted); operating system Windows 10+
Camera	Built-in or external high-definition webcam; must remain active throughout the examination
Microphone	Built-in or external microphone for monitoring the examination environment
Network	Stable broadband connection (download/upload speed of at least 5 Mbps recommended); mobile hotspots are not recommended
Browser	Latest version of Chrome or Firefox (all browser extensions must be disabled)

6.4 Examination Environment Requirements

- The examination must be conducted in a **quiet, well-lit, and private room** free from

interruptions;

- The desk surface must be clear of any books, notes, or electronic devices (smartphones, smartwatches, etc.) unrelated to the examination;
- **Headphones (over-ear or in-ear) are strictly prohibited** during the entire examination;
- The examination system will continuously record video, screen activity, and audio throughout the examination, and proctors reserve the right to intervene at any time.

VII. Score Release and Certification

7.1 Score Release

- Examination results will be released through the official registration system within **4 weeks** after the examination date.
- Candidates may check their results by logging into their personal accounts and will also receive a score notification via their registered email address.
- Score reports indicate only a "**Pass**" or "**Fail**" status; specific numerical scores will not be disclosed.

7.2 Certification

Candidates who successfully pass all three levels will be awarded the **Certified Fintech Analyst Institute (CFTA)** certification. The certificate is issued by the CFTA Testing Center and remains valid indefinitely. The certificate holder's name will be listed in the CFTA official certified holder directory.

7.3 Continuing Education Requirements

To ensure that certificate holders continue to stay current with industry advances, CFTA encourages holders to complete a minimum of **10 hours** of Continuing Education (CE) activities annually, in forms including but not limited to: CFTA-organized webinars, industry conference attendance, and publication of research papers in relevant fields. Continuing education records are maintained by the certificate holder and are subject to random audits by CFTA.

VIII. Examination Discipline and Violation Handling

8.1 Prohibited Conduct

The following actions constitute violations, and CFTA reserves the right to cancel examination scores and suspend or revoke examination eligibility:

- Consulting any books, notes, or digital reference materials during the examination

(except where explicitly permitted for open-book questions);

- Communicating with others or receiving assistance from others during the examination;
- Impersonation or proxy testing, or having another individual remotely control the computer;
- Using mobile phones, smartwatches, secondary monitors, or other electronic devices not previously disclosed during the examination;
- Reproducing or disseminating examination questions in any form after the examination concludes;
- Intentionally obstructing the webcam or leaving the examination seat during online proctoring.

8.2 Violation Handling

Upon substantiation of any violation, CFTA may impose one or more of the following sanctions:

1. Cancellation of examination scores for the current attempt;
2. Suspension of eligibility to take CFTA examinations for a period of 1 to 3 years;
3. Revocation of previously awarded CFTA certification (in cases involving passed levels).

IX. Candidate Services and Support

Service Type	Contact Information / Channel
Registration Inquiries	support@cftainstitute.org
Deferral Applications	exam@cftainstitute.org
Time Zone Adjustment Requests	exam@cftainstitute.org
Certification and Credentials	support@cftainstitute.org
Examination Technical Support (ATA)	Live Chat on examination platform
Official Website	www.cftaintitute.org (Please refer to the official website for the most current information)

Important Notice: In the event of any updates or revisions to the content of this document, the final version published on CFTA's official website shall prevail. Candidates are strongly advised to check the official website for the latest examination schedules and policies prior to registration.

Level I Examination Curriculum

I. Level I Examination Positioning and Objectives

Level I is designed to establish **foundational fintech knowledge and essential skills**. Candidates are expected to develop proficiency in Python programming fundamentals, database operations, core statistical concepts, macroeconomic analysis frameworks, and financial statement interpretation. Level I primarily assesses whether candidates possess the foundational "tool-based" competencies necessary to enter the fintech field.

Examination Format: Multiple Choice (60%) + Applied Questions including Programming (40%)

Passing Standard: 100 total points; 70 points or above required to pass

II. Level I Subject-Specific Curricula

Subject 1: Python for Data Analysis (Weight: 30%)

Examination Objective

To assess candidates' fundamental ability to use Python for financial data acquisition, cleaning, analysis, and visualization, with particular emphasis on practical application of core libraries including pandas, NumPy, and Matplotlib.

Examination Content and Competency Requirements

Knowledge Module	Competency Level	Specific Requirements
Python Basic Syntax	2	Master variables, data types, control flow, function definition and invocation
NumPy Array Operations	2	Master ndarray creation and operations, vectorization, broadcasting
pandas Data Structures	3	Master Series and DataFrame creation, indexing, filtering, merging, and group aggregation
Data Cleaning	3	Master missing value handling, duplicate detection, data type conversion, outlier

Knowledge Module	Competency Level	Specific Requirements
		identification
Data Visualization	2	Master basic plotting with Matplotlib and Seaborn (line charts, bar charts, scatter plots, heatmaps)
Financial Data I/O	2	Master reading and writing CSV and Excel files, and data format conversion

Competency Level Definitions: 1=Understanding and Memorization; 2=Understanding with Basic Application; 3=Proficient Application and Mastery

Required Textbook

- McKinney, Wes. *Python for Data Analysis* (3rd Edition). O'Reilly Media.

Subject 2: MySQL Database (Weight: 20%)

Examination Objective

To assess candidates' understanding of fundamental relational database principles and their ability to write SQL queries, as well as practical skills in storing and retrieving financial data from databases.

Examination Content and Competency Requirements

Knowledge Module	Competency Level	Specific Requirements
Basic Database Concepts	1	Understand the distinction between relational and non-relational databases, table structure design principles
DDL Statements	2	Master CREATE, ALTER, DROP and other data definition operations
DML Statements	3	Master INSERT, UPDATE, DELETE data manipulation

Knowledge Module	Competency Level	Specific Requirements
Single Table Queries	3	Master SELECT, WHERE, ORDER BY, GROUP BY, aggregate functions
Multi-Table Joins	3	Master INNER JOIN, LEFT JOIN, and subquery usage
View	3	Master CREATE, DROP VIEW, and view usage

Required Textbook

- Murach, Joel. *Murach's MySQL* (3rd Edition). Murach & Associates.

Subject 3: Statistics (Weight: 10%)**Examination Objective**

To assess candidates' fundamental understanding and application of commonly used statistical methods in financial data analysis, with emphasis on descriptive statistics, probability fundamentals, and core concepts of inferential statistics.

Examination Content and Competency Requirements

Knowledge Module	Competency Level	Specific Requirements
Descriptive Statistics	2	Master calculation and interpretation of mean, median, variance, standard deviation, skewness, kurtosis
Probability Fundamentals	2	Master event probability, conditional probability, Bayes' theorem
Random Variables and Distributions	2	Master normal, t-distribution, chi-square distribution and their applications in finance
Sampling and Estimation	2	Understand sampling methods, Central Limit Theorem, confidence intervals

Knowledge Module	Competency Level	Specific Requirements
Hypothesis Testing	2	Master t-tests, chi-square tests—principles and result interpretation
Correlation and Regression	1	Understand basic concepts of correlation coefficient and simple linear regression

Required Textbook

- Anderson, David R., Dennis J. Sweeney, Thomas A. Williams. *Statistics for Business and Economics* (13th Edition). Cengage Learning.

Subject 4: Macroeconomics (Weight: 15%)

Examination Objective

To assess candidates' fundamental understanding of macroeconomic dynamics and their ability to analyze how macroeconomic variables influence financial markets and fintech development.

Examination Content and Competency Requirements

Knowledge Module	Competency Level	Specific Requirements
Macroeconomic Indicators	2	Master the meaning and calculation of GDP, CPI, unemployment rate, PMI
Aggregate Demand and Supply	2	Understand the mechanisms of AD and AS curve shifts
Money and Banking System	2	Understand money supply, interest rate determination, central bank functions
Monetary Policy	3	Master Federal Reserve monetary policy tools and their impact on financial markets
Fiscal Policy	2	Understand the impact mechanisms of

Knowledge Module	Competency Level	Specific Requirements
		government spending and taxation
Economic Growth and Cycles	2	Master identification of business cycle phases and determinants of long-term growth
International Economics	1	Understand exchange rates, balance of payments, and globalization's impact on financial markets

Required Textbook

- Mankiw, N. Gregory. *Macroeconomics* (Latest Edition). Worth Publishers.

Subject 5: Financial Statement Analysis (Weight: 25%)

Examination Objective

To assess candidates' core ability to use financial information for corporate valuation and credit analysis, with emphasis on interpreting the three major financial statements rather than bookkeeping skills.

Examination Content and Competency Requirements

Knowledge Module	Competency Level	Specific Requirements
Balance Sheet Analysis	3	Master the composition of assets, liabilities, and equity; understand liquidity and solvency ratios
Income Statement Analysis	3	Master the structural analysis of revenue, costs, and profits; understand profitability ratios
Cash Flow Statement Analysis	3	Master analysis of operating, investing, and financing cash flows
Financial Ratio Analysis	3	Master calculation and interpretation of liquidity, leverage, profitability, and market

Knowledge Module	Competency Level	Specific Requirements
		performance ratios
Earnings Quality Analysis	2	Identify the impact of non-recurring items and revenue recognition policies on earnings
Financial Forecasting and Valuation	2	Master basic financial forecasting methods; understand foundational valuation concepts

Required Textbook

- Gibson, Charles H. *Financial Reporting and Analysis: Using Financial Accounting Information* (13th Edition). Cengage Learning.

Level II Examination Curriculum

I. Level II Examination Positioning and Objectives

Level II is designed to develop **the integration of core financial theory with technological tools**. Building upon the programming and data foundation established in Level I, candidates are expected to develop a deep understanding of investments, corporate finance, algorithmic trading, behavioral finance, and ESG investing, while applying technological tools to solve financial problems. Level II is benchmarked against the CFA knowledge framework and requires candidates to possess a solid foundation in financial theory.

Examination Format: Multiple Choice (40%) + Applied Questions including Programming (60%)

Passing Standard: 100 total points; 70 points or above required to pass

II. Level II Subject-Specific Curricula

Subject 1: Algorithmic Trading Technology (Weight: 30%)

Examination Objective

To assess candidates' systematic understanding of quantitative trading strategy design, backtesting, and execution logic, with the ability to implement trading signal generation, strategy backtesting, and performance evaluation using programming languages.

Examination Content and Competency Requirements

Knowledge Module	Competency Level	Specific Requirements
Algorithmic Trading Overview	1	Understand the development history, market structure, and key participants
Strategy Signal Generation	3	Master signal construction methods for mean-reversion, momentum, and statistical arbitrage strategies
Backtesting Methodology	3	Master backtesting framework design, avoiding look-ahead bias, and transaction cost modeling
Performance Evaluation	2	Master calculation and interpretation of Sharpe ratio, maximum drawdown, win rate, and profit/loss ratio
Execution Algorithms	2	Understand the principles of VWAP, TWAP, and POV order execution algorithms
Risk Management	2	Master position sizing, stop-loss/take-profit mechanisms, and risk budgeting methods

Required Textbook

- Chan, Ernie. *Algorithmic Trading: Winning Strategies and Their Rationale*. Wiley.

Subject 2: Investments (Weight: 25%)

Examination Objective

To assess candidates' mastery of core concepts in asset pricing, portfolio theory, and security analysis, as well as the ability to apply quantitative tools to investment decision-making.

Examination Content and Competency Requirements

Knowledge Module	Competency Level	Specific Requirements
Asset Classes and Financial Markets	2	Master the essential characteristics of stocks, bonds, derivatives, and alternative investments
Risk and Return Measurement	3	Master historical and expected return measurement, volatility and downside risk calculation
Modern Portfolio Theory	3	Master Markowitz mean-variance optimization, efficient frontier, and optimal risky portfolio
Capital Asset Pricing Model	3	Master CAPM derivation and application, estimation and interpretation of beta coefficients
Factor Models	2	Understand the Fama-French three-factor model and multi-factor model frameworks
Bond Valuation	2	Master bond pricing, duration and convexity calculation and application
Derivatives Pricing	2	Understand fundamental principles of futures and options pricing (basic Black-Scholes framework)

Required Textbook

- Bodie, Zvi, Alex Kane, Alan J. Marcus. *Investments* (6th Edition). McGraw-Hill Education.

Subject 3: Corporate Finance (Weight: 20%)

Examination Objective

To assess candidates' theoretical understanding and practical application skills in corporate investment decisions, capital structure, and financing strategies.

Examination Content and Competency Requirements

Knowledge Module	Competency Level	Specific Requirements
Capital Budgeting	3	Master calculation and application of NPV, IRR, payback period and other investment decision metrics
Cost of Capital	3	Master calculation and application of Weighted Average Cost of Capital (WACC)
Capital Structure Theory	2	Understand Modigliani-Miller theorem, trade-off theory, and pecking order theory
Dividend Policy	2	Understand the impact of dividend policy on firm value
Corporate Valuation	3	Master DCF valuation, comparable company analysis, and precedent transaction methods
Mergers and Acquisitions	1	Understand the basic motivations and transaction structures of M&A

Required Textbook

- Ross, Stephen A., Randolph W. Westerfield, Jeffrey Jaffe. *Corporate Finance* (9th Edition). McGraw-Hill Education.

Subject 4: Behavioral Finance (Weight: 10%)

Examination Objective

To assess candidates' systematic understanding of irrational behaviors and cognitive biases in financial markets, and how behavioral finance modifies and supplements traditional financial theory.

Examination Content and Competency Requirements

Knowledge Module	Competency Level	Specific Requirements
Cognitive Biases	3	Master representativeness bias, availability bias, overconfidence, anchoring effect and other core concepts
Prospect Theory	2	Understand the financial implications of loss aversion, certainty effect, and reference dependence
Behavioral Asset Pricing	2	Understand behavioral explanations for asset pricing anomalies (momentum, reversal, excess volatility)
Behavioral Corporate Finance	1	Understand the impact of managerial irrationality on investment and financing decisions
Investor Behavior	2	Master the causes and consequences of disposition effect, herding behavior, and home bias

Required Textbook

- Ackert, Lucy, Richard Deaves. *Behavioral Finance: Psychology, Decision-Making, and Markets*. Cengage Learning.

Subject 5: ESG Investing and Practice (Weight: 15%)

Examination Objective

To assess candidates' systematic understanding of how environmental, social, and governance factors influence investment decisions and corporate value, as well as practical approaches to ESG investment strategies.

Examination Content and Competency Requirements

Knowledge Module	Competency Level	Specific Requirements
ESG Framework	2	Master the core issues and indicator systems across environmental, social, and governance dimensions
ESG Ratings and Methodologies	2	Understand methodological differences among major ESG rating agencies
ESG Integration Strategies	3	Master negative screening, positive screening, thematic investing, impact investing and other ESG strategies
Climate Risk and Finance	2	Understand the potential impact of climate change on asset valuation and portfolios
Regulation and Disclosure	2	Understand global ESG disclosure standards and regulatory trends
ESG Performance Evaluation	2	Master performance measurement and attribution analysis methods for ESG investing

Required Textbook

- Mobius, Mark, et al. *ESG Investing: A Comprehensive Guide to Environmental, Social, and Governance Factors*. Wiley.

Level III Examination Curriculum

I. Level III Examination Positioning and Objectives

Level III is designed to develop **data processing, analysis, and cutting-edge technology application** capabilities. Candidates are expected to master the full technical chain from web data acquisition and machine learning modeling to data warehousing and visualization, large

language model applications, and AI governance. Level III primarily assesses candidates' ability to apply cutting-edge technologies to solve practical problems across the four major fintech application scenarios: valuation and pricing, portfolio management, quantitative trading, and risk management.

Examination Format: Multiple Choice (40%) + Applied Questions including Programming and Case Analysis (60%)

Passing Standard: 100 total points; 70 points or above required to pass

II. Level III Subject-Specific Curricula

Subject 1: Web Data Acquisition (Weight: 15%)

Examination Objective

To assess candidates' ability to acquire unstructured financial data—such as earnings report text, news sentiment, and valuation data—from the web, with emphasis on web scraping fundamentals and data parsing techniques.

Examination Content and Competency Requirements

Knowledge Module	Competency Level	Specific Requirements
HTTP Protocol Fundamentals	2	Understand request-response mechanisms and the meaning and application of status codes
HTML Parsing	3	Master BeautifulSoup, XPath, and regular expression usage
Dynamic Web Content Acquisition	2	Understand the application of Selenium in dynamic page data extraction
API Data Acquisition	2	Master methods for obtaining financial data through RESTful APIs
Data Cleaning and Structuring	3	Master methods for converting unstructured data into structured data
Anti-Scraping and	1	Understand Robots protocol, request rate

Knowledge Module	Competency Level	Specific Requirements
Compliance		control, and legal compliance requirements

Required Textbook

- Mitchell, Ryan. *Web Scraping with Python: Data Extraction from the Modern Web* (3rd Edition). O'Reilly Media.

Subject 2: Machine Learning (Weight: 25%)

Examination Objective

To assess candidates' understanding and practical application of core machine learning algorithms in finance, with emphasis on supervised and unsupervised learning applications in credit scoring, factor selection, and risk prediction.

Examination Content and Competency Requirements

Knowledge Module	Competency Level	Specific Requirements
Machine Learning Fundamentals	2	Understand overfitting and underfitting, bias-variance trade-off, and data partitioning into training/validation/test sets
Linear Models	3	Master the principles of linear regression and logistic regression and their applications in financial forecasting
Tree-Based Models	3	Master the principles and hyperparameter tuning of decision trees, random forests, and gradient boosting (XGBoost/LightGBM)
Support Vector Machines	2	Understand the basic principles of SVM and kernel function selection
Unsupervised Learning	2	Master clustering analysis (K-Means) and dimensionality reduction (PCA) applications in

Knowledge Module	Competency Level	Specific Requirements
		financial data
Model Evaluation	3	Master calculation and interpretation of confusion matrix, ROC/AUC, MSE, MAE and other evaluation metrics
Feature Engineering	3	Master feature construction, feature selection, encoding, and normalization methods

Required Textbook

- Hastie, Trevor, Robert Tibshirani, Jerome Friedman. *The Elements of Statistical Learning: Data Mining, Inference, and Prediction* (2nd Edition). Springer.

Subject 3: Data Warehousing and Data Visualization (Weight: 20%)

Examination Objective

To assess candidates' understanding of data warehouse layered architecture principles and their ability to use **Tableau** for financial data analysis and visual presentation, with emphasis on the four core financial capability ratios (solvency, operating efficiency, profitability, and growth capability) through combinations of basic chart types and dashboard interactivity to communicate corporate financial health to management.

Examination Content and Competency Requirements

Knowledge Module	Competency Level	Specific Requirements
Data Warehouse Layered Architecture	2	Understand the design principles and data flow logic of ODS→DW→DM three-layer structure
ETL and Data Preprocessing	2	Understand the core logic of data extraction, transformation, and loading;

Knowledge Module	Competency Level	Specific Requirements
		use Python/Pandas to prepare financial raw data for analysis
Dimensional Modeling Fundamentals	2	Understand basic star schema concepts (fact tables and dimension tables)
Tableau Basic Operations	3	Master data connection, worksheet creation, calculated fields, and filter usage
Four Financial Capabilities Chart Presentation	3	Solvency: bar charts; Profitability: line charts; Operating Efficiency: dashboards; Growth Capability: pie charts
Dashboard Interactive Linking	3	Master dashboard construction and linkage filtering across charts
Data Storytelling	2	Master dashboard layout principles and guide viewers with titles, annotations, and tooltips
Power BI Awareness	1	Understand the differences in interface and operational logic between Power BI and Tableau; DAX language is not required

Required Textbook

- Knafllic, Cole Nussbaumer. *Storytelling with Data: A Data Visualization Guide for Business Professionals*. Wiley.

Subject 4: Large Language Models and Applications (Weight: 25%)

Examination Objective

To assess candidates' systematic understanding of Large Language Model (LLM) technical principles and their application scenarios in the financial industry, with emphasis on five key

technology areas: Agent Architecture, Prompt Engineering, Knowledge Bases and GraphRAG, Rule Engines, and Machine Writing.

Given the extremely rapid pace of development in the LLM field, some content areas currently lack comprehensive U.S. textbook coverage. This course will be supplemented with materials from leading U.S. academic conference proceedings, open-source project documentation, and industry white papers.

Module 4.1: Agents and Autonomous Task Execution

Examination Content and Competency Requirements

Knowledge Module	Competency Level	Specific Requirements
Agent Basic Concepts	2	Understand the definition of an Agent as an artificial entity capable of perceiving environments, making decisions, and taking actions
LLM Agent Three-Component Architecture	3	Master the core functions and interrelationships of Brain (reasoning and planning), Perception (multimodal information processing), and Action (tool use and embodied behavior)
How Agents Extend LLM Capabilities	2	Understand that LLMs serve as the Agent's "brain," while Agents provide "eyes and hands" to perceive external environments and execute tasks, overcoming the limitation that LLMs "can only answer questions but cannot execute complete tasks"
OpenClaw Multi-Agent Collaboration	3	Master the working principles of OpenClaw multi-agent collaboration: automatic task decomposition → skill matching → parallel execution → result aggregation
Multi-Agent Collaboration Modes	2	Understand the principles and application scenarios of commander mode, pipeline mode, and hybrid mode

Reference Materials

- Xi, Zhiheng, et al. "The Rise and Potential of Large Language Model Based Agents: A

Survey." *Science China Information Sciences*, 2025.

- OpenClaw Official Documentation: Multi-Agent Teams and Parallel Specialist Lanes.

Module 4.2: Prompt Engineering

Examination Content and Competency Requirements

Knowledge Module	Competency Level	Specific Requirements
Basic Components of Prompts	2	Master the four essential components: Instructions, Context, Examples, and Constraints
Role Prompting	2	Understand techniques for guiding model output style and content direction through role assignments
Few-Shot Learning	2	Master methods for improving task accuracy by providing examples in prompts
Chain-of-Thought	2	Understand the principle of triggering step-by-step reasoning through "Let's think step by step"
Systematic Prompting Framework	3	Master the Task-Context-Reference-Evaluate-Iterate systematic prompt design methodology

Reference Materials

- OpenAI Official Prompt Engineering Guide.
- Anthropic Claude Official Prompt Engineering Documentation.

Module 4.3: Knowledge Bases and GraphRAG

Examination Content and Competency Requirements

Knowledge Module	Competency Level	Specific Requirements
Causes of AI Hallucination	2	Understand the root cause—LLMs fabricate plausible responses when unable to match to factual answers
Value of Private Knowledge Bases	2	Understand that building private and reliable knowledge bases is essential for eliminating

Knowledge Module	Competency Level	Specific Requirements
		hallucinations
Vector Database Fundamentals	2	Understand basic concepts of vector retrieval and its application in RAG
Limitations of Traditional RAG	2	Understand that vector retrieval suffers from information omission and cannot capture relational associations between knowledge entities
GraphRAG Technical Principles	3	Master the architecture of graph-enhanced retrieval-augmented generation—combining knowledge graphs with vector retrieval
Microsoft GraphRAG	2	Understand Microsoft GraphRAG's core concepts and its advantages in solving knowledge relation challenges
Neo4j Graph Database	2	Understand Neo4j's basic concepts and application scenarios as a leading graph knowledge base software

Reference Materials

- Microsoft Research. "GraphRAG: Unlocking LLM Discovery on Narrative Private Data." Microsoft Research Blog, 2024.
- Neo4j Official Documentation and GraphRAG Technical Blog Posts.

Module 4.4: Rule Engines

Examination Content and Competency Requirements

Knowledge Module	Competency Level	Specific Requirements
Inherent Uncertainty of LLMs	2	Understand the intrinsic reason why LLMs produce different outputs each time (probabilistic models)

Knowledge Module	Competency Level	Specific Requirements
Definition and Role of Rule Engines	3	Understand the core value of rule engines as "deterministic engines"—hardened, auditable, and interpretable
Deterministic vs. Probabilistic Engines	2	Master the complementary relationship: LLMs process unstructured content; rule engines handle exact reasoning and decision-making
Rule Engine Working Principles	2	Understand the basic workflow: rule definition → data input → matching evaluation → output generation
Financial Application Scenarios	3	Master the application logic of rule engines in credit underwriting, compliance review, and risk control—AI should prioritize (or even exclusively use) hardened rules from the rule library
Neuro-Symbolic AI Framework	1	Understand the composite AI engineering framework integrating LLMs with rule engines

Reference Materials

- Red Hat / IBM. Drools Rule Engine Project Documentation.
- "Neuro-Symbolic AI: A Survey." *Artificial Intelligence Review*. (U.S. academic journal)

Module 4.5: Machine Writing

Examination Content and Competency Requirements

Knowledge Module	Competency Level	Specific Requirements
Technological Evolution of Machine Writing	1	Understand the paradigm shift from "visual analytics + manual reporting" to "AI-automated report generation"
Three-Layer Architecture	3	Master the architecture: Knowledge Base

Knowledge Module	Competency Level	Specific Requirements
of Machine Writing		(ensuring data accuracy) + Rule Engine (ensuring deterministic logic) + Template Technology (ensuring format consistency)
Financial Application Scenarios	2	Understand requirements for automated generation of risk investigation reports, project proposal reports, financial analysis reports and other professional financial documents
Jinja2 Template Engine	3	Master variable substitution, conditional logic (<code>{% if %}</code>), loops (<code>{% for %}</code>), and template inheritance
python-docx Library	2	Master basic operations: document creation, paragraph operations, table operations, style configuration
docxtpl Template Rendering	3	Master the docxtpl workflow: template loading → context data preparation → rendering → document saving
Impact on Analyst Work Practices	2	Understand the shift in analyst focus: from "report writing" to "template design, output review, and deep analysis"

Reference Materials

- Jinja2 Template Engine Documentation. Pallets Projects.
- python-docx Official Documentation.

Level III Module Weight Summary for Large Language Models and Applications

Module	Weight
Agents and Autonomous Task Execution	25%

Module	Weight
Prompt Engineering	15%
Knowledge Bases and GraphRAG	25%
Rule Engines	15%
Machine Writing	20%
Total	100%

Subject 5: Artificial Intelligence and Regulation (Weight: 15%)

Examination Objective

To assess candidates' systematic understanding of compliance requirements and ethical governance for AI applications in finance, with emphasis on model interpretability, algorithmic fairness, data privacy protection, and regulatory technology.

Examination Content and Competency Requirements

Knowledge Module	Competency Level	Specific Requirements
AI Regulatory Frameworks	2	Understand the latest developments and core requirements of EU AI Act and U.S. state-level AI legislation
Model Interpretability	3	Master the application of SHAP, LIME and other interpretability tools in financial models
Algorithmic Fairness	2	Understand methods for detecting and mitigating algorithmic bias (e.g., discrimination in credit underwriting)
Data Privacy Protection	2	Understand the application of differential privacy and federated learning in financial data sharing

Knowledge Module	Competency Level	Specific Requirements
Generative AI Compliance Risks	2	Master compliance review considerations for LLM applications in financial scenarios
Regulatory Technology	1	Understand RegTech practices in automated compliance monitoring and report generation

Required Textbook

- Chishti, Susanne, et al. *The AI Book: The Artificial Intelligence Handbook for Investors, Entrepreneurs and FinTech Visionaries*. Wiley.

Appendix: Programming Question Design and Study Recommendations

Programming Question Design Philosophy

This certification program includes programming-based practical questions at all levels. In the context of rapidly advancing Large Language Models, CFTA has carefully evaluated and decided **not to eliminate programming questions**, but to comprehensively optimize their design:

- Question Format Evolution:** Programming questions are structured as "core code completion + code debugging + output interpretation" rather than requiring complete programs to be written from scratch.
- Competency Focus:** Emphasis is placed on candidates' ability to translate financial business logic into code and to identify and correct logical errors in code—skills that current LLMs cannot fully replace.
- LLM Literacy Assessment:** Level III examinations will include questions of the type "Given an LLM-generated code snippet for financial data analysis, identify the logical or risk issues present" to assess candidates' ability to critically review AI output.

Study Recommendations

- **Level I Candidates:** Focus on Python programming practice and financial statement analysis—the two highest-weighted subjects accounting for 55% of the total. Though Statistics has a lower weight (10%), it serves as the foundation for subsequent machine learning studies and should not be neglected.
- **Level II Candidates:** Prioritize Algorithmic Trading Technology (30%) and Investments (25%), which together account for more than half of the total score. Behavioral Finance has a lower weight but is concept-intensive and well-suited for short-term focused study.
- **Level III Candidates:** Machine Learning (25%) and Large Language Models and Applications (25%) are the two core subjects and merit substantial study time. Within the LLM module, Agent and GraphRAG represent the most current frontier topics—candidates should pay particular attention to announcements from U.S. technology leaders (e.g., Microsoft, OpenAI, Anthropic) and publications from top-tier U.S. conferences (e.g., NeurIPS, ICML, ACL).

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