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**CHICAGO**

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**CAREER ADVANCEMENT**  
Financial Markets Program

# **Quantitative Finance Recruiting Guide**

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*University of Chicago | Career Advancement Financial Markets*

## Overview of Quantitative Finance

At a high level, quantitative finance uses mathematics, statistics, and programming to make data-driven decisions in financial markets. Unlike other roles in finance, quant finance focuses much more on technical rigor than relationships and sales.

UChicago is uniquely positioned to help students break into this space because of its location within the derivatives capital of the world (derivatives are an asset class explored and used heavily in quant finance). The industry is known for being lucrative, fast-paced, and constantly evolving, with roles spanning trading, research, and software development.

### Key Terminology

Term	Definition
Buy-Side	Firms that invest their own or clients' money to generate profits (e.g., hedge funds, prop shops, asset managers).
Sell-Side	Institutions like banks that facilitate trading and capital markets activity for clients.
Prop Shop	An independent firm that trades exclusively with its own capital for profit (e.g., Jane Street, HRT).
Market Making	Providing continuous buy and sell quotes for a security, profiting from the bid-ask spread.
Alpha	Excess return generated by a strategy above a benchmark; finding alpha is central to quant research.
Systematic Trading	Trading driven entirely by models and algorithms with minimal human discretion.
Discretionary Trading	Trading driven by human judgment, sometimes informed by quantitative tools.

## Quant Roles

There are three core roles in quantitative finance. While they are deeply interconnected and the boundaries blur at smaller firms, each has a distinct focus, skill set, and day-to-day experience.

### Quant Researcher

Researchers develop mathematical and statistical models to identify trading opportunities and design strategies. The role is deeply analytical, involving probability theory, time-series analysis, machine learning, and signal research.

- Heavy focus on probability, statistics, and machine learning
- Design and backtest systematic trading strategies
- Work with large datasets to identify predictive signals
- Strong fit for students who enjoy deeper math, research, and data modeling
- Common majors: Mathematics, Statistics, Physics, Computer Science

### Quant Trader

Traders sit between systematic and discretionary, using models and real-time data to make trading decisions. The role is fast-paced and combines analytical thinking with intuition and market judgment.

- Use models and data to make real-time decisions (options pricing, market making, arbitrage)
- Monitor strategy performance and update parameters throughout the trading day
- Combine speed, pattern recognition, and quantitative tools
- Requires strong mental math, probability intuition, and composure under pressure
- Common majors: Mathematics, Economics, Statistics, Computer Science

### Quant Developer (Software Engineer)

Developers build and maintain the infrastructure that makes trading possible: execution systems, data pipelines, backtesting frameworks, and low-latency software. At many firms this is called a “Software Engineer” or “Systems Developer” role.

- Build and optimize trading systems and infrastructure
- Strong emphasis on programming (Python, C++, Java) and software engineering principles
- Focus on speed, efficiency, and reliability — latency matters in microseconds
- Work closely with traders and researchers to implement strategies
- Common majors: Computer Science, Electrical Engineering

## Risk Management

Risk managers identify, measure, and monitor the financial risks a firm is exposed to, including market risk, credit risk, liquidity risk, and operational risk. Compared to the researcher, trader, and developer roles, new grad risk management positions are relatively rare at quant firms; most entry-level risk hires come from grad programs or internal transfers. That said, banks and large asset managers do hire new grads directly into risk, and it is a strong path for quantitatively-minded students drawn more to analysis and oversight than trading or building.

- Monitor and report on portfolio exposures, P&L, and risk limits on a daily basis
- Build and maintain risk models (VaR, stress testing, scenario analysis)
- Work closely with traders and researchers to understand and challenge their strategies
- Understand regulatory frameworks (Basel, Dodd-Frank) and internal risk governance
- Common majors: Mathematics, Statistics, Economics, Computer Science

## Major Roles Comparison at a Glance

	Researcher	Trader	Developer
Core Skill	Math / Modeling	Intuition + Quant	Programming
Pace	Slower, iterative	Real-time, fast	Project-based
Key Tools	Python, R, MATLAB	Python, Excel, C++	C++, Python, Java
Relevant Majors	Math, Stats, Physics	Math, Econ, Stats	CS, EE

## Types of Firms

Quant roles exist across several types of financial firms, each with different goals, timelines, cultures, and work environments. Understanding the differences is critical for targeting your search and answering “Why this firm?” with conviction.

### Trading Firms / Prop Shops

The most competitive and highest-paying segment of quant finance. Prop shops trade their own capital, so there are no external clients. Culture tends to be flat, intellectually rigorous, and highly meritocratic.

- Focus on short-term trading, market making, and statistical arbitrage
- Highly data-driven with real-time decision-making
- Emphasis on speed, efficiency, and execution quality
- Flat structure with significant autonomy for strong performers
- Examples: Jane Street, Hudson River Trading (HRT), Citadel Securities, Chicago Trading Company (CTC), Optiver, Akuna Capital, DRW, IMC, Jump Trading, Virtu Financial

## Hedge Funds and Asset Managers

Hedge funds take a longer time horizon than prop shops and manage external investor capital. They use a range of systematic strategies to generate alpha, with more emphasis on research and modeling.

- Research-heavy and model-driven environments
- Longer time horizons than prop shops (days to months vs. milliseconds to hours)
- Focus on finding and exploiting market inefficiencies
- Portfolio management and risk management are central concerns
- Examples: Citadel (flagship), Two Sigma, D.E. Shaw, Bridgewater, Renaissance Technologies, Point72, Millennium

## Banks (Sell-Side)

Large financial institutions that facilitate trading and capital markets activity for clients. Quant roles at banks include structuring, derivatives pricing, risk, and electronic trading. Hours and culture differ significantly from prop shops.

- Strong emphasis on infrastructure, pricing models, and client-facing work
- More bureaucratic than prop shops, but strong training and global exposure
- Sell-side quant roles include: Strats, Structuring, Quant Research, Electronic Trading
- Examples: Goldman Sachs (Securities Division), Morgan Stanley, JP Morgan, Citadel Securities (MM arm)

## In-House / Corporate Quants

Large corporations hire quants internally to manage financial exposure and risk. This is a less competitive path but can still be technically interesting.

- Focus on hedging risks (FX, commodities, interest rates)
- Less trading, more risk management and financial forecasting
- Much lower pressure and compensation than prop shops or hedge funds
- Examples: bp, Walmart, Boeing, airline treasury desks

## Recruiting Timeline

Quant recruiting runs earlier and faster than you'd expect. Unlike IB, there is no single "recruiting season" — some firms recruit on a rolling basis, while others open and close within days. Starting early and staying organized is non-negotiable.

## 1st Year: Build the Foundation

1. Focus on your coursework in mathematics, probability, statistics, and programming. Calculus, linear algebra, probability theory, and an intro CS/Python course are the minimum baseline.
2. Attend info sessions from quant firms visiting campus and join quant clubs (Maroon Capital, DGQT). These are low-pressure ways to learn what roles actually look like.
3. Start learning the technical content. Brain teasers, probability puzzles, and expected value problems are asked in every quant interview at every level.
4. Apply to the Trading Immersion Week. It is a four-day program in September designed to introduce students to financial markets careers with firm exposure and recruiting strategy sessions.
5. Find a freshman summer internship or research position if possible. It doesn't have to be quant finance. Anything analytical (research, CS, data science) helps build a story.

## 1st Year Spring Onward: Discovery Programs, Research, and Preliminary Internships

Many top prop shops and hedge funds offer discovery weeks, spring insight programs, or diversity programs for first-year students. These are often the best way to get a foot in the door. But research opportunities and preliminary (prior to 3rd year Summer) internships are also a great way to gain experience.

- Apply to discovery/insight programs as early as they open because many fill within days
- Examples: Jane Street FOCUS, HRT Discovery, Citadel Datathon, Two Sigma Undergraduate Research
- Use these programs to network and convert into internship pipelines
- Treat every interaction during these programs as an interview
- Apply for research opportunities and 1st / 2nd year Summer internships to gain experience and make connections prior to the 3rd year Summer internship.
- Examples: AQR and Optiver offer early internships, places like Old Mission have winter internships, research for professors on campus, the Math department has summer research called REU

## 2nd Year Spring – 3rd Year Fall: Internship Recruiting

This is the primary internship recruiting window for rising 3rd years (the summer between 2nd and 3rd year). This is your most important internship, and most full-time offers come from converting a 3rd year internship.

1. Begin applying in early spring of your 2nd year for summer internship roles.
2. Bank internship applications (Goldman, Morgan Stanley, JP Morgan) open first, typically in January. Apply immediately and you must network for these roles.
3. Prop shop and hedge fund applications open on a rolling basis.
4. Prepare for technical interviews: probability, brain teasers, coding, and mental math.

### 3rd Year Summer: The Internship

Treat your internship as a 10-12 week interview. The primary goal is a full-time return offer.

- Be curious, ask good questions, and show intellectual engagement
- Build relationships with full-time researchers, traders, and developers
- Take ownership of your project — don't just execute, think about the "why"
- If you don't receive a return offer, begin full-time recruiting immediately in fall

### 4th Year: Full-Time Recruiting

If you have a return offer, congratulations! If you're still recruiting, move fast. Full-time quant roles are filled on a rolling basis throughout fall.

- Leverage your internship experience and any research to demonstrate signal
- Continue networking because alumni connections matter more for full-time than internship recruiting
- Firms that didn't give you an internship offer are still worth approaching for full-time
- Don't underestimate smaller firms and prop shops. Their compensation is often comparable to top names

### Trading Immersion Week

The Trading Immersion Program is a four-day program held in September, designed to introduce students to careers in financial markets and trading. It covers both traditional markets (equities, fixed income, derivatives) and alternative strategies, while building a clear roadmap for recruiting.

- Applications available on UChicago Handshake
- Interactive workshops on market structure, risk management, and trading strategies
- Live trading simulations for hands-on experience
- Employer panels, firm overviews, and direct networking with professionals
- Career strategy sessions on recruiting timelines, resume guidance, and positioning

### Networking

Networking in quant finance is less central than in IB. You can and will get interviews based purely on your technical credentials and resume. That said, networking still helps, especially for smaller firms that don't recruit broadly and for converting warm introductions into expedited interview processes.

## When and How to Reach Out

- Prioritize quant alumni from UChicago. They are most likely to respond and advocate for you
- Attend firm-sponsored info sessions and follow up with specific people you spoke with
- LinkedIn is more effective in quant finance than in IB. Many quants are active and responsive
- Be direct and technically credible in your outreach. Quants respect intellectual honesty
- Don't ask for a "resume review" — ask specific, thoughtful questions about their work or career path

## Sample Networking Email

Keep it short, specific, and genuine. Quants have little patience for generic emails.

*Hi [First Name],*

*I'm [Name], a [year] at UChicago studying [major]. I came across your work on [specific topic/firm] and wanted to reach out. I've been exploring quant research roles and your path from [background] to [firm] stood out to me.*

*I'd love to ask you a few questions about [specific aspect of their work]. Would you be open to a 15-minute call? Happy to work around your schedule.*

*Thanks, [Name]*

## Networking Call Framework

Keep calls focused and intellectually engaged. Quants respond well to genuine curiosity about their work, not generic "what's a day in the life" questions.

1. Open with a brief, confident introduction (60 seconds max): name, background, what you're working on, why you're interested in their firm/role specifically.
2. Ask substantive questions about their work ie. research methodology, the problems they're solving, how they think about market microstructure, etc.
3. Ask about their career path and what they wish they'd known earlier.
4. At the close, ask for advice and, if the call went well, whether there's someone else they'd recommend you speak with.
5. Send a thank you email within 24 hours. Reference something specific from the conversation.

## Behavioral Interviews

Behavioral interviews in quant finance are shorter and less scripted than in IB, but they still matter. Firms want to know you're intellectually honest, genuinely curious, and not just chasing compensation. Authenticity matters more than polish here.

## Tell Me About Yourself / Walk Me Through Your Background

This is your most important answer. Aim for 60–90 seconds. Structure it as: who you are → what sparked your interest in quant → what you've done to pursue it → where you want to go.

Example Arc 1: Strong math background → took probability / stochastic processes → worked on a research project or competition (Citadel Datathon, Kaggle) → now excited about applying this at a prop shop.

Example Arc 2: CS background → interested in algorithmic systems → built a trading simulation or strategy backtester → drawn to the developer role at a trading firm.

Example Arc 3: Physics / applied math → interested in modeling complex systems → internship in data science or research → drawn to quant research for its intersection of rigor and real-world application.

## Why Quant Finance? Why This Firm?

These answers should be specific. "I like math and finance" is not sufficient.

- Tie your interest to a specific aspect of quant — the intellectual rigor, the feedback loop of real-world testing, the intersection of math and markets
- Reference something specific about the firm. For examples, their market making strategy, a paper their team published, a product they trade, their culture or reputation
- If you've spoken with people at the firm, reference that conversation

## Other Common Behavioralals

### Intellectual Curiosity / Problem-Solving

- Tell me about a difficult problem you worked through — mathematical or otherwise.
- What's a concept you've recently learned that genuinely excited you?
- Tell me about a time your initial approach to a problem was wrong. How did you recover?

### Resilience and Work Ethic

- Tell me about a time you failed at something. What did you learn?
- Describe a project where you had to push through significant uncertainty or ambiguity.
- Tell me about a time you worked on something extremely difficult with no clear answer.

### Teamwork and Communication

- Tell me about a time you had to explain a complex technical concept to a non-technical audience.
- Describe a group project where there was disagreement. How did you navigate it?
- Tell me about a time you collaborated across different skill sets (math, CS, domain knowledge).

## Strengths / Weaknesses

- What are you better at than most people you know? (be specific and genuine)
- What's something technical you're actively trying to improve? How?
- What has prepared you to succeed in this role?

## Technical Interviews

Technical interviews are the centerpiece of quant recruiting. Expect them to be harder and more varied than IB technicals. A single strong technical answer can carry you; a single weak one can end your process. The categories below cover virtually everything you'll face.

### 1. Probability and Statistics

This is the most tested area across all quant roles. You must be fully fluent in the following:

#### Core Concepts

- Expected value, variance, covariance, standard deviation
- Conditional probability and Bayes' theorem (practiced to the point of instinct)
- Common distributions: Normal, Binomial, Poisson, Geometric, Exponential, Uniform
- Law of large numbers, central limit theorem
- Independence vs. uncorrelated: know the distinction cold
- Moment generating functions and their uses

#### Classic Problem Types

- Expected number of trials until event X (e.g., flips until HH, rolls until sum of 7)
- Gambler's ruin, random walk problems
- Balls in urns, sampling with and without replacement
- Conditional expectation problems (tower property, iterated expectations)
- Coupon collector, birthday problem, secretary problem

### 2. Brain Teasers and Logic Puzzles

Brain teasers test how you think under pressure, not just whether you know the answer. Always think out loud. Interviewers care as much about your reasoning process as your conclusion.

- Classic types: weighing problems, clock angles, logical paradoxes, invariant-based puzzles
- Show your reasoning step by step
- If you're stuck, try small cases or simplify the problem first
- Don't panic if you can't solve it; show methodical thinking
- Common sources: "Puzzled Quant" blog, xinfinity.io, glassdoor interview questions

### 3. Mental Math

Many firms, particularly market makers like Jane Street, Optiver, and Akuna, will test mental arithmetic directly. This is a trainable skill. Practice daily.

- Multiplication of two and three digit numbers quickly
- Percentage calculations and fractions to decimals
- Estimation problems: “How many golf balls fit in this room?”
- Rapid calculation of probabilities and expected values in trading scenarios
- Resource: “Math of Wall Street” Optiver practice games, Zetamac arithmetic trainer

### 4. Coding and Algorithms

Required primarily for developer roles, but researcher and trader candidates at many firms will also face a coding component. Python is the most common language; C++ is critical for developer roles.

- Data structures: arrays, hash maps, linked lists, trees, heaps
- Algorithms: sorting, searching, BFS/DFS, dynamic programming
- Common quant-specific problems: simulation, Monte Carlo estimation, time series manipulation
- Python fluency: pandas, numpy, writing clean and efficient code
- Resource: LeetCode (medium difficulty is sufficient for most roles), HackerRank

### 5. Statistics and Machine Learning (Researcher Roles)

For research-focused interviews, expect deeper questions on statistical modeling, inference, and machine learning methodology.

- Linear regression: assumptions, OLS derivation, hypothesis testing, multicollinearity
- Time series: stationarity, autocorrelation, ARIMA models
- Classification and regression: logistic regression, decision trees, random forests, gradient boosting
- Overfitting, regularization (L1/L2), cross-validation
- Dimensionality reduction: PCA, factor models
- Backtesting pitfalls: lookahead bias, survivorship bias, overfitting to historical data

## 6. Finance and Markets Knowledge

Not all firms test finance knowledge, but you should understand basics of how markets work.

- Options basics: calls, puts, intrinsic vs. time value, payoff diagrams
- The Greeks: delta, gamma, theta, vega. What they mean intuitively
- What is market making and how does a market maker make money?
- Bid-ask spread: what drives it, who benefits
- What happens when the Fed raises rates? Walk through the chain of effects.

## Recommended Resources

Resource	What It Covers
A Practical Guide to Quantitative Finance Interviews (“Green Book”)	Brain teasers, probability, statistics, finance. It is the definitive quant interview prep book
Fifty Challenging Problems in Probability	Probability puzzles ranging from accessible to hard which are great for building intuition
LeetCode	Coding problems for developer and researcher candidates
Zetamac / Arithmetic Trainer	Mental math speed practice
Optiver Trader Test Practice	Mental arithmetic under time pressure, modeled on real trader interviews
Glassdoor (Jane Street, HRT, Citadel)	Real interview questions reported by past candidates
xinfinity.io / PuzzledQuant / OpenQuant	Brain teasers and logic puzzles common in quant interviews

## Interview Tips and Strategy

### General Approach

- Think out loud — interviewers want to see how you reason, not just whether you land on the right answer
- When stuck, say so and explain what you’re trying. “I’m not immediately sure, but let me try approaching it from...”
- Don’t bluff on technical questions. If you don’t know something, say so honestly and try to reason from first principles
- Ask clarifying questions before diving in, especially on ambiguous probability problems
- Practice doing problems under time pressure. Speed matters at many firms

## Know Your Resume

- Every project, research paper, or internship on your resume is fair game
- Be able to explain the technical methodology behind anything you've done in depth
- Anticipate follow-up questions: "Why did you use that model? What would you do differently?"
- If you've done any independent quant research or strategy development, be ready to walk through it in detail

## Research the Firm

- Understand what the firm actually does: market making, stat arb, macro, multi-strategy
- Know which products they trade (equities, options, fixed income, crypto, commodities)
- If the firm has published papers or blog posts, read them and be ready to discuss
- Prepare 2–3 thoughtful questions that demonstrate you've done your homework

## After the Interview

- Send a thank-you email within 24 hours to your recruiter and any interviewers whose contact info you have
- Reference something specific from the conversation in your note
- If you don't hear back within the expected timeline, a single polite follow-up is appropriate

## Locations and Firm Geography

Unlike IB where NYC dominates, quant finance is more geographically distributed. Chicago is one of the strongest quant hubs in the world. UChicago's location is a genuine advantage.

### Chicago

One of the two most important quant hubs globally alongside New York. Chicago's strength comes from its deep roots in options and derivatives markets (CBOE, CME). The Chicago office of virtually every major prop shop is large and active.

- Home base for: Jane Street (major presence), Chicago Trading Company, Akuna Capital, DRW, Jump Trading, IMC, Optiver, Virtu, Group One Trading
- UChicago alumni network is very strong. You should lean into it
- Recruiting is often faster and more direct than NYC; firms recruit heavily from UChicago

## New York

HQ for most hedge funds and the major bank quant groups. Also home to large prop shop offices.

- Citadel, Two Sigma, D.E. Shaw, Point72, Renaissance are NYC-based
- Bank quant roles (Goldman Strats, Morgan Stanley Quant Research) are almost exclusively NYC
- More competitive and more formal recruiting than Chicago

## Remote / Distributed

Some firms have expanded to distributed models post-COVID. Many still require co-location, especially for roles involving real-time trading.

## Final Notes

Quant recruiting rewards genuine intellectual curiosity more than any other finance career path. The students who succeed are those who find the problems genuinely interesting — not just those who grind interview prep. That said, preparation is still essential.

- Start technical preparation early. A semester of daily practice is far better than a month of cramming
- Build projects and put them on your resume: options pricers, strategy backtests, ML models, simulations
- Compete in quant competitions: Citadel Datathon, IMC Prosperity, Jane Street ETC. These signal directly to firms your interest and abilities
- Get involved in quant clubs at UChicago: Maroon Capital, DGQT, Poker Club, Financial Markets Program
- Stay intellectually curious. Read about market microstructure, stochastic calculus, and algorithmic trading even if it's not on a syllabus
- Ask for feedback whenever you can. Mock interviews with upperclassmen who have gone through the process are invaluable
- Use Career Advancement! They have a ton of resources just like this document

*Good luck. The process is hard, but UChicago students are well-equipped for it.*