

Resources for Exploring Careers in Quantitative Analysis

A quantitative analyst (a quant) specializes in applying of mathematical and statistical methods to financial problems. They use calculations, modeling, and research to make predictions and guide strategies in finance and risk management. See this video for a more detailed introduction to quant roles, <https://www.youtube.com/watch?v=bCAnTbTU8M0>.

Explore The Variety of Career Paths With These Example Fields & Roles

Look up these titles or fields on <http://www.indeed.com/> or LinkedIn to learn more about what projects they work on and what skills are needed. This information is also useful when writing your application documents and preparing for interviews.

Front office quantitative analyst (FOQs)

- Determine prices, manage risk, identify profitable opportunities
- A greater emphasis on solutions to specific problems than detailed modeling
- May not need software engineering experience or formal training

Library quantitative analysis(LQs)

- Produce standard methods of evaluating prices and risk
- Use Monte Carlo methods and finite difference methods
- C++/ Java/ C# is more valued

Algorithmic trading quantitative analyst (ATQs)

- Use signal processing, game theory, gambling Kelly criterion, market microstructure, and time series analysis
- Potentially modify hardware and Linux kernels to increase speed of work
- Often the highest paid of the quants

Risk management

- Knowledge of value at risk (risky asset)
- Conduct stress tests, economic capital analysis, and evaluation of models
- Increasing in importance since economic crisis of 2008

Model validation (MV)

- Validate models developed by other departments
- Knowledge of new methods and trading techniques
- Report directly to regulators

Quantitative developer

- Computer specialist
- Assist, implement, and maintain quantitative models
- Adept with programming and coding languages
- Bridge gap between software developer and quantitative analysts

Read Additional Quant Analyst and Career Resources

A thorough introduction to quant roles

<https://www.quantstart.com/>

Steps to becoming a quant trader

<http://www.investopedia.com/articles/active-trading/112614/steps-becoming-quant-trader.asp>

Detailed academic requirement for quant

- <http://www.academicinvest.com/science-careers/mathematics-careers/how-to-become-a-quantitative-analyst>
- http://study.com/quantitative_analyst_education.html

Break into an entry-level quant role

<http://news.efinancialcareers.com/us-en/160595/how-to-break-into-a-quant-role-with-little-or-no-experience/>

Suggestions from professionals

<https://www.quantnet.com/threads/how-to-get-a-quant-job-advice-from-wall-street-executives.4537/>

Meet Finance Professionals to Talk About Opportunities and Their Careers

Global Association Risk Professionals, <https://www.garp.org/#!/home>

Professional Risk Managers' International Association, <http://www.prmia.org/>

Algorithmic Traders Association, <https://www.atassn.com/>

International Association for Quantitative Finance, <http://www.iaqf.org/>

Society of Quantitative Analysts, <http://www.sqa-us.org/>

Contact Duke alumni and other professionals in quant roles for informational interviews

- Duke Alumni Association, <https://alumni.duke.edu/>
- Alumni on LinkedIn (use the Find Alumni tool under My Network)
- LinkedIn Groups: QUANT FINANCE / QUANTITATIVE FINANCE; Quant with Matlab, C++, C#, Java, VBA, Excel; Algorithmic Traders Association

Build These Specific Skill Sets and Highlight Them When Applying

We summarized these skills from professionals' LinkedIn profiles, job postings, and sources such as Investopedia. Particular jobs may not require all of these skill sets, so find out from online resources and professionals you meet which of these skills sets are most relevant.

Communication

- Even above programming and technical skills, hiring managers say they need a quant with the ability to communicate with others at the company

Quantitative analysis

- In-depth knowledge of math
- Understanding of and experience with trade strategies, algorithms, and trade execution methods
- Conduct research
- Usage of Bloomberg Terminals and other sources of data

Risk and stress

- Understanding of risk management and risk mitigation techniques
- Thrive in stressful situations
- Meeting deadlines
- Work long hours as needed

Innovation

- Search for new, innovative ideas
- Seize opportunities
- Comfort with failure
- Consider non-traditional solutions to problems

Programming

- Data mining
- Automated trading systems
- Programming languages such as C++, Java, Python and Perl
- Familiarity with tools such as MATLAB and spreadsheets
- Handling and structuring large data sets

Gain Experience

You can gain experience in many ways that involve different amounts of time investment.

Apply for research assistant positions

- Research assistants with excellent quantitative skills are always in need
- Email professors you are interested in, explain why you're interested, list skills you have, and ask for an RA opportunity
- Try professors in the Duke Economics Dept. and Fuqua School of Business
- Some professors will also post positions at the Social Science Research Institute, <https://connect.ssri.duke.edu/>

Intern with Duke Data and Visualization Services

- You will be responsible for consulting with students about data management and statistical analysis
- Contact staff about possible open positions, <http://library.duke.edu/data/about/staff>

Internships in finance

Though not essential for entry-level positions, an internship is a great way to gain experience and exposure to finance and a real-world work environment

Enroll in courses at Duke Fuqua School of Business, <http://tinyurl.com/CoursesInOtherDukeSchools>

Complete online courses from Coursera to learn more about finance broadly or programming in C++, Java, Python, or other languages

<https://www.coursera.org/>

Attend workshops with Duke Libraries Data and Visualization Services

<http://library.duke.edu/data/news>

Learn to use the financial data and news features of a Bloomberg Terminal at Duke

<http://guides.library.duke.edu/bloomberg>

Assist with projects for finance professionals you meet

Should You Pursue an Additional Degree or Certification?

Your career goals will determine which degrees or certifications may be useful credentials.

A Master's Degree in Financial Engineering (MFE) can help when transitioning into quant careers, particularly at investment banks. Courses in these programs can improve your knowledge of derivatives pricing, portfolio management, risk management, and software development. Tuition and fees for an MFE program can total \$50,000, and for some quant roles there is preference given to PhDs and research experience. Some hiring managers also say that they would equally hire someone with a master's degree in a non-finance field as someone with an MFE if they have the same level of experience and abilities. Before investing the time and money in an additional degree, consider how well your current skills align with quant roles and if an MFE is the best way to obtain those skills and build a network in the field.

Finance Job Search Tools

Consider the common skills required by jobs and internships.

QuantFinance Job

<http://www.quantfinancejobs.com/>

Duke CareerConnections, jobs and events hosted by the Duke Career Center

<http://careerconnections.duke.edu/>