



# CQF Welcome Booklet

[7city.com/cqf](http://7city.com/cqf)

Blackboard content:

- Stochastic process diagram:  $dX = \dots dt + (a - bX) dW$
- Integration:  $\int_a^b f(x) dx$
- Geometric Brownian motion:  $dS = \mu S dt + \sigma S dW$
- Lognormal distribution:  $d(\ln S) = \frac{1}{S} dS - \frac{1}{2} \sigma^2 dt$
- Call option payoff:  $\max(0, S_T - K)$
- Call option price:  $V_c = e^{-rT} \mathbb{E}[\max(0, S_T - K)]$
- Call option price formula:  $V_c = e^{-rT} \left[ 1 + \frac{1}{2} \ln \left( \frac{K}{S_0} e^{(r+\lambda_b)t} \right) \right]$
- Call option price expansion:  $V_c = V_{\infty} + \frac{1}{2} \sigma^2 S_0^2 t + \rho b g V_{r,\lambda} + \frac{\sigma^2}{2} V_{\lambda\lambda} + (a - \lambda_b) V_r - (f - \nu g) V_\lambda - r V = 0$
- Call option price simplified:  $V_c = e^{-rT} (A + B r + C \lambda) + \frac{1}{2} \sigma^2 S_0^2 t + \rho b g B + \frac{\sigma^2}{2} C + (a - \lambda_b) B + (f - \nu g) C$
- Parameter values:  $r = 0.09$ ,  $\rho = 0$ ,  $b, g = \sqrt{\text{linear in } r \text{ and } \lambda}$ ,  $\nu = 1 - \rho$ ,  $A = \text{Most plausible}$ ,  $\sigma = \text{const.}$ ,  $\lambda = 0.75$ ,  $S_0 = 100$ ,  $K = 110$ ,  $t = 1$ ,  $a = 2.8$ ,  $b = 0.32$ ,  $c = 0.32$ ,  $f = 118$ ,  $\nu = 0.65$

Bottom right corner: WILMOTT | **7city**  
LEARNING

## A message from the Course Director

Welcome to our program for practitioner education in quantitative finance. In this booklet you will find an introduction to the key areas of your Certificate in Quantitative Finance training programme.

All training is delivered simultaneously live in the classroom and via international webcast. This global delivery puts us at the forefront for distance learning.

Our team of lecturers consists of full-time staff chosen for their training skills and dedication to client satisfaction, along with respected and experienced practitioners working in investment banks and hedge funds.

Finance is an extremely fast-paced and increasingly sophisticated profession. We can help you and your company stay ahead of the competition. We are proud of the quality and relevance of our quantitative finance program, and we are continually striving to keep it the best in the world.

I look forward to working with you.

Yours sincerely,



**Paul Wilmott**  
Course Director



# Contents

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The CQF Team	4
Math Skills	5
Course Content	6
Online Training	7
Schedule	8
Exams	8/9
Lifelong Learning	10
CQF Community	11

## The CQF Team

### Paul Shaw

Head of Admissions

Email: [p.shaw@7city.com](mailto:p.shaw@7city.com)

Direct Line: +44 (0) 207 496 8601

Responsible for: Career Advice



### Claire Riseley

Programme Manager

Email: [c.riseley@7city.com](mailto:c.riseley@7city.com)

Direct Line: +44 (0) 207 496 8605

Responsible for: Course Management /Payment /Liaising with Faculty



### James Dixon

Programme Administrator

Email: [j.dixon@7city.com](mailto:j.dixon@7city.com)

Direct Line: +44 (0) 207 496 8667

Responsible for: Exams / Lecture Notes / Books



### Geoff Brown

Product Manager

Email: [g.brown@7city.com](mailto:g.brown@7city.com)

Direct Line: +44 (0)207 496 8636

Responsible for: Enquiries from colleagues / Friends interested in the CQF



### Alistair Young

CQF Marketing Executive

Email: [a.young@7city.com](mailto:a.young@7city.com)

Direct Line: +1 646 943 6217

Responsible for: CQF Marketing & Communications



### Help Desk

If you're unsure who to direct your query to why not log a helpdesk and the appropriate member of your CQF team will respond. Log on to your CQF alumni website at [cqfalumni.com](http://cqfalumni.com) and go to:

- Contact us
- Support
- Click on "Log a helpdesk query with your 7city team"

### IT Support

- Online Portal Queries – Contact the content team via your online helpdesk or contact Claire Riseley
- IT Support – Queries during live classes – email [webcaster@7city.com](mailto:webcaster@7city.com) or call +44 (0) 845 072 7620
- IT Support – Queries during working hours – email [itsupport@7city.com](mailto:itsupport@7city.com) or call +44 (0) 207 496 8699

# Math Skills

7city.com/cqf

## Math Primer

We offer the Mathematics for Quantitative Finance primer course at no extra cost for confirmed CQF delegates. It is ideal for pre-CQF candidates to brush up on their math skills, and also for financial professionals seeking a short but intensive refresher in the areas of differential equations, linear algebra and probability.

Some things you may wish to consider:

- Mathematical finance is now a pre-requisite for financial practitioners.
- You will build a solid mathematical foundation with which to further your career
- Delivered part time, via 19 hours of classroom and/or distance learning

## Topics

The following modules will be studied over the duration of the math primer:

### Calculus and Differential Equations Refresher

- Functions of single variables
- Functions of two or more variables

### Linear Algebra and Probability Refresher

- Matrices
- Elementary probability theory

## Schedule

You can obtain a full schedule for the Math Primer programmes running this year by contacting Claire on [c.riseley@7city.com](mailto:c.riseley@7city.com) or James on [j.dixon@7city.com](mailto:j.dixon@7city.com).

## Registration

In order to book a place on the Math Primer of your choice please contact Claire at [c.riseley@7city.com](mailto:c.riseley@7city.com). Once you have registered you will automatically receive log on details to view recorded lectures and associated materials.

# Course Content

## Learning Pathway

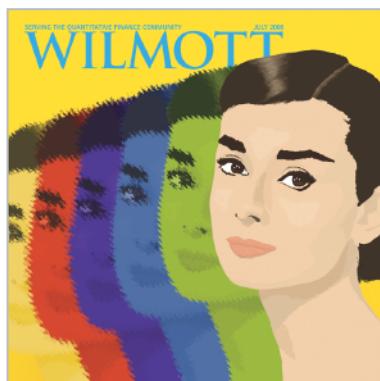
In order to view a breakdown of each module and lecture as well as information on additional reading and ongoing training please view the learning pathway. This can be found on your alumni website. Once you have logged in please go to:

- Learning Resources
- Your CQF Program

## CQF Textbooks

You should now have received the standard 8 textbooks which you will refer to over the duration of your training programme. If you have any queries regarding the delivery of your text books please contact James at [j.dixon@7city.com](mailto:j.dixon@7city.com). Your core CQF textbooks are:

- 1) *Paul Wilmott on Quantitative Finance*
- 2) *Advanced Modelling in Finance using Excel and VBA* by Mary Jackson and Mike Staunton
- 3) *Monte Carlo Methods in Finance* by Peter Jaeckel
- 4) *Frequently Asked Questions in Quantitative Finance* by Paul Wilmott
- 5) *The Complete Guide to Option Pricing Formulas* by Espen Haug
- 6) *Derivatives: Models on Models* by Espen Haug
- 7) *Paul Wilmott Introduces Quantitative Finance*
- 8) *Structural Credit Products: Credit Derivatives and Synthetic Securitisation* by Moorad Choudhury



## Wilmott Magazines

By joining the CQF programme you receive a one year subscription to *Wilmott* magazine. Please send your preferred delivery address to James at [j.dixon@7city.com](mailto:j.dixon@7city.com).

## Course Materials

Prior to each lecture, you will receive an email with a PDF copy of the lectures slides, as well as relevant problem sheets. These problem sheets are for you to complete in your own time and do not need to be submitted. You will be sent the solutions within one week. Classroom learners will also receive a hardcopy of the notes in the lecture.

# Online Training

7city.com/cqf

## Logging on to your CQF alumni website

You will receive your log on details to the CQF alumni site ([cqfalumni.com](http://cqfalumni.com)) the day before you commence your training. If you mislay your Username and Password please contact either Claire or James.

## Live Sessions

All CQF lectures are streamed live over the web. In order to view the live lectures you will need to log into your CQF alumni website. Please go to:

- Learning Resources
- Webcast
- Select this link to the CQF program web cast

The first time you view a streamed live lecture we would recommend that you log on 30 minutes prior to the start of the lecture to test your link. Please refer to the Webcast section of your CQF alumni website for advice on how to test your link. If you have any queries contact IT Support at [itsupport@7city.com](mailto:itsupport@7city.com)

## Recordings

All CQF sessions are recorded and then posted on your CQF alumni website so you are able to watch them in your own time. Recordings will be made available within 24 hours of the lecture taking place. To view your recorded lectures please go to:

- Learning Resources
- Your CQF programme

As well as the lecture recordings you will also be able to view and download your annotated class notes, whiteboard notes, exercises and solutions on this site.

## Laptops

Laptops are used in class for a handful of lectures (see schedule for details). You will be e-mailed all relevant documents 48 hours before the lecture takes place. These documents need to be uploaded to your computer/laptop prior to the lecture commencing.

Classroom learners are expected to bring their own laptops to class. However if you do not have access to a laptop 7city have a limited number available to CQF delegates. These may be reserved on a first come first served basis. To avoid disappointment please let James ([j.dixon@7city.com](mailto:j.dixon@7city.com)) know as soon as possible if you are unable to bring your laptop to a lecture and would like to reserve one of 7city's.

## Schedule

### Online Schedule

In order to view a timetable of your learning please log onto the alumni website and go to:

- Learning Resources
- Your CQF Program

Please be aware that the schedule is subject to change but we do ensure that all delegates receive sufficient notice of changes whenever possible.

## Exams

The Certificate in Quantitative Finance will be awarded to delegates based on their performance in the compulsory modular assessments (exams and project). Weekly exercises do not contribute to a delegate's formal score.

### Module Examinations (modules 1 to 5) and Project (module 6)

Examinations will be issued following the last session of modules 1-5. Please see course schedule for exact dates. Delegates will have one week to complete the paper and lecture notes and books may be referred to.

Papers should preferably be uploaded to the CQF FTP site. An FTP guide can be found on the alumni website. Once you have logged in please go to:

- Learning Resources
- Your CQF Program

However papers can also be submitted by email or fax to James ([j.dixon@7city.com](mailto:j.dixon@7city.com) or **+44 (0) 207 496 8607**). Mathematics can be handwritten or typeset. Delegate scores will be sent out to each delegate within 2 weeks of the examination paper being completed.

Note: Delegates may request up to two exam extensions during the course of the program. These extensions are typically for up to two weeks. Extension requests should be submitted to James ([j.dixon@7city.com](mailto:j.dixon@7city.com)) prior to distribution of the relevant exam paper. Delegates who hand in exams later than agreed or who take more than two extensions will be ranked at the bottom of the class. Class rankings are included in individual delegate's official results letters and may be requested by prospective employers.

Module 6 is assessed with a project. Please see course schedule for project distribution and deadline dates. Projects will not be accepted after the deadline.

Delegates' marks for all modules will contribute towards their overall certificate. The pass mark for each module is set at 60%.

### Final Examination and the Award of Distinctions (Non-compulsory)

The final examination is optional and does not affect the overall result achieved from the Module Examinations.

Delegates scoring 80% and above in the final exam will be awarded a distinction. Delegates who opt to take the final exam will be required to attend an invigilated examination centre (date to be confirmed). This exam takes place over three hours. Please refer to separate list of available exam locations on your CQF alumni website:

- Learning Resources
- Your CQF Programme

We will contact you closer to the time with the exact date of this exam and ask you to confirm whether you will participate and if so, your preferred location. Please note this exam is closed book. Use of calculators is permitted but no access to notes, books, or laptops will be allowed.

From each class, one delegate will receive the "Wilmott Award". This will be made to the delegate attaining the highest score in the final examination and they will receive Wiley Credits with a value of £150.

### CQF Graduation

Examination results for the Certificate in Quantitative Finance will be announced in the following publications:

- *Financial Times* (UK and International Editions)
- *Economist*
- *Wilmott* magazine

Delegates will be listed by name and company where appropriate. Delegates receiving a pass or distinction will be listed, in addition to the delegate receiving the "Wilmott Award" and the delegate achieving the highest average score over the six core modules.

In addition all graduates receive a detailed results letter which includes their average score over the six modules, class ranking and grade (pass, distinction, First-in-class or Wilmott Award for Distinction).

### Graduation Ceremony

On graduation CQF Faculty, recent graduates and alumni will meet to celebrate your success and award you your certificate (location and date to be confirmed). Graduates who are unable to attend in person will receive their certificate by post along with our warm congratulations!

# Lifelong Learning

## CQF Extra Lectures

To ensure CQF alumni are supported after they have obtained their qualification, additional extra classes are delivered on both technical and topical issues. These classes are delivered by the CQF faculty in addition to world-class practitioners.

All classes can be attended in the classroom and live or recorded via the Alumni Website as part of the CQF continuing education program.

The CQF library is constantly being updated and added to. Additional classes and resources are stored in this single place, allowing delegates and alumni to track and enhance their knowledge base.

The Extra classes can be accessed by logging into the alumni and then going to:

- Learning Resources
- CQF Extra Classes

## C++

Your CQF alumni site also includes, at no extra cost, 28 recorded lectures on C++. These lectures are based upon object oriented programming in C++. These sessions are designed to develop your problem solving skills using C++ together with numerical analysis which have applications in quantitative finance. This online course does assume that you are familiar with basic C++ (or C). To access these recordings please log on to your CQF alumni site and go to:

- Learning Resources
- C++ classes

## Trading Simulator

What is the trading simulator? The trading simulator simulates a market using plotted data rather than the current market prices. You can trade against electronic traders in single-user mode, or against other traders in group mode.

What instruments can we trade on it? We will start with equity options and explore options trading and Greeks hedging on an individual underlying and at the portfolio level. Later in the course, we will look to include more complex option types and other financial instruments including currency and fixed income.

How can I use the simulator? Initially the trading sessions will be group sessions for a large number of traders for which we will provide login details. Subsequently, the platform will be made available to individual users to try out their own approaches.

What do I need to download in order to run the simulator on my computer? The simulator runs in all standard web browsers. You will not need to download a separate program.

# CQF Community

7city.com/cqf

On commencement of the CQF your name, locality, company, job area and email address will automatically be uploaded to the CQF directory. Please note only CQF alumni have access to this directory. If you do not want your details to be accessible please contact us and/or update your profile on the CQF alumni website.

A screenshot of the CQF Alumni website's directory search page. The top navigation bar includes links for 'HOME', 'ABOUT', 'COURSES', 'ALUMNI', 'FORUM', 'CONTACT', and 'LOGOUT'. The main content area has a yellow header 'CQF ALUMNI' with a world map icon. Below this is a section titled 'Directory' with a sub-section 'SEARCH'. It contains a search form with fields for 'First name', 'Surname', 'Company', 'Country' (with dropdown options like 'Any', 'UK', 'USA', 'Canada', 'Australia'), 'CQF Course' (dropdown options like 'Any', 'CQF', 'CQF Advanced', 'CQF Diploma'), and 'Job Area' (dropdown options like 'Any', 'Banking', 'Finance', 'Risk Management'). There is also a 'Search' button and a link 'View results'.

## CQF Forum

The CQF Forum is a great way to interact with fellow CQF alumni. The forum is hosted by Wilmott.com and is offered at no extra cost to CQF delegates. To register for the forum please:

1. Register on Wilmott.com. You will have to use a work/business email address as hotmail/gmail etc will not be accepted: [wilmott.com/reg.cfm](http://wilmott.com/reg.cfm)
2. Wait for an acceptance email from Wilmott.com, this may take up to 24 hours. When you receive this it means that your joining email address was acceptable. Now move on to Step 3. (If you don't get an email from Wilmott.com it may mean that your email address was 'anonymous.' In this case try to join again with a non-anonymous address.)
3. The final step to gaining access to the CQF Forum is to log on to your CQF alumni website, go to the "Forum" tab and enter your:
  - a. Name
  - b. Email address
  - c. Wilmott.com username
4. You will receive an acceptance e-mail within 24 hours and access to the Forum within 48 hours.

## CQF Events

The CQF team regularly host alumni events which offer current delegates and alumni an opportunity to network and socialise. These include:

- Drinks & snacks at the end of each Module
- Welcome and Graduation events
- CQF extra lectures
- CQF Information Sessions

We will contact you whenever there is an event in your area. If you have any queries regarding CQF events please do not hesitate to contact Claire at [c.riseley@7city.com](mailto:c.riseley@7city.com).

$$dr = \dots dt + \dots r^{1/4} dx_1 \\ dx_1 = \dots dt + (a - b\lambda)^{1/4} dx_2$$

$$dr = a dt + b dx_1$$

$$dx_1 = f dt + g dx_2$$

$$dS = \mu S dt \\ d(\ln S) = \mu dt$$

### 7city Learning

**London Training Centre:** 7city Learning , 4 Chiswell Street London EC1Y 4UP  
Tel +44 (0)20 7496 8652 Fax +44 (0)20 7496 8607 Email [cqf@7city.com](mailto:cqf@7city.com)

**New York Training Center:** 7city Learning , 55 Broad Street, 3rd floor, New York, NY 10004  
Tel + 1 (800) 974-0394 Fax + 1 (212) 480-2974 Email [cqf@7city.com](mailto:cqf@7city.com)

**Singapore Training Centre:** 7city Learning , 3 Raffles Place, 07-01 Bharat Building, Singapore, 048617  
Tel +65 6329 9646 Fax +65 6329 9699 Email [cqf@7city.com](mailto:cqf@7city.com)

$$+ pb_g V_{r\lambda} + \frac{g^2}{2} V_{\lambda\lambda} \\ + (a - b\lambda) V_n \\ + (f - \lambda g) V_\lambda - rV = 0$$

$$\therefore V = e^{A + Br + C\lambda} ?$$

$$(A + Br + C\lambda) + \frac{B^2}{2} B + pb_g B + \frac{g^2}{2} C^2 + (a - b\lambda) B + (f - \lambda g)$$

$$B = 0$$

$$b, g = \sqrt{\text{linear in } r}$$

$$pb_g = \text{linear in } r$$

Most plausible

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$$B = 0 \\ \lambda = 0$$