

Y2013 MS in Computational Finance Advising Guide

The objective of this program is to offer students the opportunity to acquire both the ability to understand existing financial models in a quantitative and mathematical way, and the ability to implement these models in the form of computer programs. This program differs from a regular MS in Finance because of a stronger mathematical component and the addition of an intensive computational component. The program aims to produce graduates with the required qualifications to become "quantitative financial analysts". The Computational Finance graduates will be able to apply these quantitative tools to solve complex problems in the areas of portfolio management, risk management, and financial engineering.

The Master of Science in Computational Finance is a joint degree between the College of Computing and Digital Media (CDM) and the Kellstadt Graduate School of Business (KGSB). Student may be admitted to the program through either CDM or KGSB.

IMPORTANT ADMISSION ISSUES

Students to be admitted need a GRE or GMAT score and need a semester calculus.

Normally we admit students with Calculus background and a GRE quantitative score in the top 20% OR students with a science and engineering background and an A grade in their math courses (calculus, linear algebra, differential equations).

Students without a GRE or GMAT test cannot be admitted (Commerce requirement)

Before the 2013 degree there was a pre-requisite phase. It included calculus. Since the 2013 the degree has a variable length and includes an Introductory phase which does not include Calculus. Knowledge of calculus is still a PREREQUISITE FOR ADMISSION in the degree. The new CSC412 includes a review of Calculus but it is not a replacement for proper calculus courses.

The CDM degree and the Commerce degree are the same but Commerce requires the GMAT not the GRE or GMAT. Students with a previous MS in Finance or an MBA may be discounted 3 Commerce courses if they enroll via Commerce. Students will get an advisor in the College where they enroll and can only apply for assistantships in that College.

Courses (variable length 13-17 courses)

Introductory Phase

(courses can be waived)

CSC401	Introduction to Programming
CSC404	Advanced C++
CSC412	Tools and Techniques for Computational Analysis
IT403	Statistics and Data Analysis

CDM Foundation Phase

CSC 423	Data Analysis and Regression	(usually offered every quarter)
CSC 425	Time Series Analysis and Forecasting	(usually offered in Winter only)
CSC 431	Scientific Computing	(usually offered in Winter only)
CSC 521	Monte Carlo Algorithms	(usually offered in Spring only)

Kellstadt Foundation Phase

ACC 500	Financial Accounting
ECO 555	Economics for Decision-Making
FIN 555	Financial Management
FIN 523	Investment Analysis
FIN 525	Portfolio Management
FIN 562	Risk Management
FIN 662	Derivatives Valuation

Advanced Courses

CSC 695	Master's Independent Study
or CSC 697	Graduate Internship
or CSC 559	Software Engineering for Financial Markets (usually offered in Spring only)

Major Elective Courses

Students must take 1 500-level course at CDM, Kellstadt, or the Department of Math.

Recommended Electives

CSC 452	Database Programming
CSC 453	Database Technologies
CSC 457	Expert Systems
CSC 458	Symbolic Programming
CSC 478	Programming Data Mining Applications
CSC 583	Artificial Intelligence II
CSC 480	Artificial Intelligence I
CSC 503	Parallel Algorithms
CSC 529	Advanced Data Mining
CSC 555	Mining Big Data
CSC 582	Machine Learning
CSC 598	Topics in Data Analysis
CSC 672	Data Analysis Workshop

Old Prerequisite Mapping

2005	2006-2009	2012	2013
MAT150/151 or MAT 160/161 or MAT 170/171	MAT150/151 or MAT 160/161 or MAT 170/171	MAT150/151 or MAT 160/161 or MAT 170/171	Students MUST know calculus prior to being admitted!
n/a	n/a	n/a	CSC412
CSC309	CSC309 or CSC261 and CSC262	CSC243 and CSC309	CSC401 and CSC404
CSC393	CSC202 and CSC321	CSC202	n/a
n/a	n/a	n/a	IT403

Waving rules

CSC412 can be waived to student with a semester of calculus (covering limits, derivatives, integrals, Taylor series, study of functions) and one quarter of linear algebra. ATTENTION: Students who do not have a semester calculus should NOT be admitted in the program!

CSC401 can be waived to students with previous programming experience in any language. But they should be recommended to take the course since it uses Python and the language will be used throughout the program.

CSC404 can be waived to students with a semester of C++ (B-)

IT403 can be waived to students who have completed a course on basics statistics (B-)

Other Substitution Rules

There is very little flexibility for substitutions in this program but...

Students with a Commerce degree in Finance or Accounting can substitute:

- FIN524 for ACC500
- FIN557 or IB530 for ECO555.

If there are scheduling reasons the following substitutions are also possible:

- FIN617 for CSC431
- MAT 459 for CSC521
- CSC453 in place of a 500 level elective