

FINANCIAL TECHNOLOGY, BACHELOR OF SCIENCE (B.S.) WITH A CONCENTRATION IN ACTUARIAL SCIENCE

The Bachelor of Science in Financial Technology offers concentrations in actuarial science and financial engineering. The program provides quantitatively oriented students the opportunity to apply mathematical, statistical and programming tools to the financial, risk management and actuarial disciplines. Designed to meet the growing need for quantitative modeling and analysis in finance, risk management and actuarial science, the program is technical and interdisciplinary in nature. The curriculum emphasizes courses in finance, statistics and mathematics with supporting courses in related areas.

The actuarial science concentration provides excellent preparation for the basic professional examinations and continued study in actuarial science. Students who complete this concentration also may find employment in areas such as quantitative applications in corporate and public financial policy, actuarial modeling and forecasting, reserves computation and rate making, and computer and information systems in the financial services and risk management industries.

Learning goals

- To support career advancement over time by giving students the academic foundation in finance and actuarial sciences needed for continued professional development
- To help students develop the professional skills that will be needed by the businesses and organizations that hire graduates
- To help students develop ethical awareness so that they are able to deal with an ethical dilemma in the workplace

Student learning outcomes

Upon completing this program, students will know and know how to do the following.

- Students will be able to identify and use relevant data to calculate appropriate quantitative measures that help in making informed actuarial calculations.
- Students will be able to describe and expound on competing propositions in a structured, organized and deliberate manner with comparisons, anecdotal evidence and descriptive analysis.
- Students will be able to express the analytic, quantitative and ethical dimensions of a business problem and proposed solutions in a clear, well-organized manner that is free of bias or distortions.

Special requirements

Students in the actuarial science concentration must attain a minimum grade of C in MATH 200, MATH 307, STAT 309, STAT 310, FIRE 319. A student receiving a grade below C may repeat the course one time to raise the grade to the required level. In addition, a minimum GPA of 2.5 must be maintained. Students who fall below a GPA of 2.5 will be placed on program probation and will be given one semester to return to the minimum GPA of 2.5. Students who do not return to the required

minimum cumulative GPA of 2.5 after two semesters will be dismissed from the financial technology major. Students who do not satisfactorily attain the minimum grade of C in one course after two attempts will be dismissed from the financial technology major. In concert with the academic adviser of the department, an appeal may be submitted to the chair of the department. A student must have a minimum GPA of 2.5 to graduate from the program. At least 30 hours of the required business courses for the Bachelor of Science must be taken at VCU.

Students admitted into this program must place into MATH 200 to continue in the program. No more than three credits in physical education courses may be applied to the degree. Many courses are offered irregularly; please work with an adviser for optimal course sequencing.

Credit for SPCH 121 or SPCH 321 will substitute for BUSN 225, and no more than three credits of these courses may be applied toward a business degree. Students who earned a minimum grade of B in either ECON 203 or ECON 205 at VCU may substitute that credit for ECON 210.

The pass/fail grading policy may not be used for many course requirements. Students should check with their academic adviser before taking the pass/fail grading option.

The School of Business has special academic policies (<http://bulletin.vcu.edu/undergraduate/business/undergraduate-information/academic-policies/>), including policies on transfer credits, that apply to all undergraduate degrees. The pass/fail grading policy may not be used for courses that can satisfy major degree requirements.

Degree requirements for Financial Technology, Bachelor of Science (B.S.) with a concentration in actuarial science

Course	Title	Hours
General education (http://bulletin.vcu.edu/undergraduate/undergraduate-study/general-education-curriculum/)		
Select 30 credits of general education courses in consultation with an adviser.		30
Major requirements		
• Major core requirements		
CMSC 210	Computers and Programming	3
FIRE 309	Risk Management and Insurance	3
FIRE 312	Financial Modeling	3
FIRE 317	Investments	3
FIRE 321	Intermediate Financial Management	3
FIRE 417	Security Analysis and Portfolio Management	3
FIRE 451	Options, Futures and Swaps	3
FIRE 479	Enterprise Risk Management	3
INFO 320	Business Intelligence and Data Mining	3
MATH 201	Calculus with Analytic Geometry II	4
MATH 211	Mathematical Structures	3
MATH 307	Multivariate Calculus	4
STAT 309	Introduction to Probability Theory	3
• Concentration requirements		
FIRE 319	Financial Mathematics	3
FIRE 320	Actuarial Probability Concepts	3
STAT 310	Introduction to Statistical Inference	3

STAT 212	Concepts of Statistics	3
Concentration electives (choose four)		12
ACCT 303	Intermediate Accounting I	
ACCT 304	Intermediate Accounting II	
BNFO 201	Computing Skills and Concepts for Bioinformatics	
BUSN 400 & BUSN 401	Principles of Consulting and International Consulting Practicum (must get credit for both courses to count toward degree completion)	
BUSN 301	Career and Professional Development	
BUSN 323	Legal Environment of Business	
CMSC 330	Data Science Skills	
ECON 307	Money and Banking	
ECON 403	Introduction to Mathematical Economics	
FIRE 305	Principles of Real Estate	
FIRE 316	International Financial Management	
FIRE 429	Property and Liability Insurance	
FIRE 439	Life and Health Insurance	
FIRE 449	Employee Benefit Planning	
FIRE 459	Insurance Law	
FIRE 461	Cases in Financial Management	
FIRE 491	Topics in Finance, Insurance and Real Estate	
FIRE 492	Independent Study in Finance, Insurance and Real Estate	
FIRE 493	Internship in Finance, Insurance and Real Estate	
FIRE 496	Practicum in Portfolio Management	
FIRE 540	Financial Analytics	
INFO 300	Information Technology Infrastructure	
INFO 350	Intermediate Programming	
MATH 310	Linear Algebra	
MGMT 310	Managing People in Organizations	
MGMT 434	Strategic Management	
MKTG 301	Marketing Principles	
MKTG 350	Customer and Marketing Analytics	
SCMA 320	Production/Operations Management	
SCMA 339	Quantitative Solutions for Supply Chain Management	
STAT 321	Introduction to Statistical Computing for Data Science	
STAT 403	Introduction to Stochastic Processes	
Ancillary requirements		
• Ancillary core courses		
ACCT 203 & ACCT 204	Introduction to Accounting I and Introduction to Accounting II	6
BUSN 225	Winning Presentations	3
ECON 210	Principles of Microeconomics (satisfies general education BOK for social/behavioral sciences and/or AOI for global perspectives)	3
ECON 211	Principles of Macroeconomics	3

FIRE 311	Financial Management	3
• Additional ancillary requirements		
MATH 200	Calculus with Analytic Geometry I (satisfies general education quantitative foundations)	4
Open electives		
Select any course. ¹		12
Total Hours		123

1

Students may choose electives to reach the minimum total of 123 credits.

The minimum number of credit hours required for this degree is 123.

What follows is a sample plan that meets the prescribed requirements within a four-year course of study at VCU. Please contact your adviser before beginning course work toward a degree.

Freshman year

Fall semester		Hours
ECON 210	Principles of Microeconomics (satisfies general education BOK for social/behavioral sciences and/or AOI for global perspectives)	3
MATH 200	Calculus with Analytic Geometry I (satisfies general education quantitative foundations)	4
UNIV 111	Focused Inquiry I (satisfies general education UNIV foundations)	3
Play course video for Focused Inquiry I		
General education course		3
General education course		3
Term Hours:		16

Spring semester

ECON 211	Principles of Macroeconomics	3
MATH 201	Calculus with Analytic Geometry II	4
STAT 212	Concepts of Statistics	3
UNIV 112	Focused Inquiry II (satisfies general education UNIV foundations)	3
Play course video for Focused Inquiry II		
General education course		3
Term Hours:		16

Sophomore year

Fall semester		Hours
ACCT 203	Introduction to Accounting I	3
FIRE 309	Risk Management and Insurance	3
FIRE 319	Financial Mathematics	3
UNIV 200	Advanced Focused Inquiry: Literacies, Research and Communication (satisfies general education UNIV foundations)	3
General education course		3
Term Hours:		15

Spring semester

ACCT 204	Introduction to Accounting II	3
BUSN 225	Winning Presentations	3
FIRE 320	Actuarial Probability Concepts	3
MATH 211	Mathematical Structures	3
General education course		3

Term Hours: 15

Junior year**Fall semester**

FIRE 311	Financial Management	3
INFO 320	Business Intelligence and Data Mining	3
STAT 309	Introduction to Probability Theory	3
MATH 307	Multivariate Calculus	4
Concentration elective		3

Term Hours: 16

Spring semester

CMSC 210	Computers and Programming	3
FIRE 312	Financial Modeling	3
FIRE 317	Investments	3
STAT 310	Introduction to Statistical Inference	3
Open elective		3

Term Hours: 15

Senior year**Fall semester**

FIRE 321	Intermediate Financial Management	3
FIRE 451	Options, Futures and Swaps	3
FIRE 479	Enterprise Risk Management	3
Concentration elective		3
Open elective		3

Term Hours: 15

Spring semester

FIRE 417	Security Analysis and Portfolio Management	3
Concentration electives		6
Open electives		6

Term Hours: 15

Total Hours: 123

The minimum number of credit hours required for this degree is 123.