ACTUARIAL SCIENCES, BS/MS ACCELERATED PROGRAM

The Mathematics and Actuarial Science faculty at Roosevelt offer an accelerated BS in Actuarial Science (http://catalog.roosevelt.edu/undergraduate/health-science/actuarial-science-bs/)/MS in Actuarial Science (http://catalog.roosevelt.edu/graduate/health-science/actuarial-sciences-ms/) program to eligible students. Students entering this program can earn both bachelor's and master's degrees in less time than earning these degrees separately would require.

Risk analysts and actuaries earn professional designation from either the Society of Actuaries (http://www.soa.org) (life and health insurance) or the Casualty Actuarial Society (http://www.casact.org) (property and casualty insurance). These societies administer a series of examinations that lead to the risk analyst designation or actuaries, first to the designation of associate and then to fellow. The initial exams are the same for both societies. The courses required for the major and the minor will aid the student in preparing for the first two of the professional societies' examinations. They will also satisfy their Validation by Educational Experience (VEE) (https://www.soa.org/education/exam-req/edu-vee.aspx) requirements in economics, corporate finance, and mathematical statistics.

Students apply to this accelerated program at the end of their sophomore years and are accepted into the degree program during their junior years (after having completed at least 60 credit hours), then begin enrolling in graduate courses in their junior and senior years (after completing at least 75 credit hours) and complete the requirements for the MS degree in their fifth years.

As undergraduates, eligible students may earn 9 credit hours (taking three graduate-level courses), which are applied toward both the undergraduate degree and the graduate degree. Graduate courses taken during the student's senior year will depend on the courses the student has remaining to complete in the undergraduate degree in actuarial science. Once the student completes the BS, the graduate-level courses taken as an undergraduate will be transferred to the student's MS transcript.

Admission

Applicants must have a desire to become professional actuaries and must be either:

1. Actuarial Science (http://catalog.roosevelt.edu/undergraduate/health-science/actuarial-science-bs/) majors at Roosevelt University, minoring in both Finance (http://catalog.roosevelt.edu/undergraduate/business/minor/finance-minor-non-business-majors/) and Computer Science (http://catalog.roosevelt.edu/undergraduate/health-science/minor/computer-science-minor/), having a 3.25 GPA (or better) in all actuarial science or mathematics courses taken at Roosevelt, with a minimum of three of these courses by the time of application, or other evidence of scholarly capability. Students should apply at the end of their sophomore years.
2. High school students accepted into the BS in Actuarial Science with a 3.5 GPA (or higher) and a 25 ACT (or higher), or other evidence of scholarly capability.
3. Transfer students who have completed Calculus 1-3 (equivalent to MATH 231 CALCULUS I, MATH 232 CALCULUS II, and MATH 233 CALCULUS III at Roosevelt) having a 3.25 GPA (or better) in all actuarial science or mathematics courses taken at the college level. Students should contact the department chair at Roosevelt indicating their intent to apply. Many community colleges have specific articulation agreements with Roosevelt, and so students are encouraged to also discuss their degree plans with their transfer coordinator.

Accepted students must also agree to finish their MS program at Roosevelt and maintain good standing in master's-level courses.

Acceptance into the program will be decided by a departmental committee.

Degree awards

The BS is awarded when all undergraduate requirements are completed (with substitution of three graduate-level courses for three undergraduate courses). The MS is awarded when all graduate requirements are completed.

Application deadline: May 1

Requirements

- At least four courses in Actuarial Science must be completed at Roosevelt University.
- A student completing a Bachelor of Science degree in Actuarial Science must take at least one professional exam prior to graduation. Proof should be submitted to the department chair.
- All credit must be approved by the department to be applied toward the major.
- At least 60 semester hours must be in actuarial science, mathematics, computer science, natural sciences and/or psychology. (Note that typically fulfilling the standard general education requirements, the major requirements, and the computer science minor will result in at least 60 semester hours.)
- The BS degree requires both a minor in Finance (http://catalog.roosevelt.edu/undergraduate/business/minor/finance-minor-non-business-majors/) and an additional minor in Computer (http://catalog.roosevelt.edu/undergraduate/health-science/minor/computer-science-minor/)Science (http://catalog.roosevelt.edu/undergraduate/health-science/minor/computer-science-minor/).
- All courses presented for the undergraduate major must be completed with C- or higher grades with an overall GPA of 2.0 or higher in undergraduate coursework. A maximum of two grades of C- may be presented for the undergraduate major.
- At most two grades of C or C+ are allowed in graduate courses; all other graduate coursework must have a grade of B- or higher, with a graduate GPA of at least 3.0.
- The completed degree requires a total of 33 credit hours of graduate coursework (which includes the 9 credit hours of graduate courses taken as an undergraduate).

Recommendations

- Appropriate supporting courses in computer science, economics, and finance are recommended.
- Students should prepare to take an actuarial professional exam early in their degree plan, as this is often a requirement for actuarial internships. Both ACSC 367 FINANCIAL MATH and ACSC 347 PROBABILITY THEORY correspond to the content of the first two of these actuarial professional exams; the corresponding seminar

- courses ACSC 380FM ACTUARIAL SCIENCE SEMINAR:EXAM FM/2 and MATH 480P ACTUARIAL SCI SEM: EXAM P/1 aid in exam preparation.
- Students are encouraged to take ACSC 390 INDUSTRIAL RESEARCH PROBLEMS as part of their experiential learning coursework.
- Students are encouraged to do an actuarial, computing, financial, or statistical internship prior to graduation.

Code	Title	Credit Hours
Core		
ACSC 101	ACTUARIAL CAREER	1
MATH 231	CALCULUS I	5
MATH 232	CALCULUS II	5
MATH 233	CALCULUS III	3
ACSC 246	LINEAR ALGEBRA	3
ACSC 347	PROBABILITY THEORY	3
ACSC 348	MATHEMATICAL STATISTICS (will be graduate MATH 448)	3
ACSC 349	REGRESSION & TIME SERIES (will be graduate MATH 449)	3
ACSC 367	FINANCIAL MATH	3
ACSC 380FM	ACTUARIAL SCIENCE SEMINAR:EXAM FM/2	3
Select two of the following:		6
ACSC 309	DATA MINING	
ACSC 323	COOPERATION AND COMPETITION -- GAME THEORY AND APPLICATIONS	
ACSC 328	LINEAR PROGRAMMING & OPTIMIZATION	
ACSC 366	ADVANCED EXCEL METHODS	
ACSC 369	MODELS FOR LIFE CONTINGENCIES	
ACSC 378	TOPICS IN ACTUARIAL MATH	
ACSC 380FM	ACTUARIAL SCIENCE SEMINAR:EXAM FM/2	
or ACSC 380P	ACTUARIAL SCIENCE SEMINAR: EXAM P/1	
VEE requirement (part of Finance minor)		
ECON 101	PRINCIPLES OF ECONOMICS I (fulfills a portion of the social science gen ed requirement)	3
ECON 102	PRINCIPLES OF ECONOMICS II (fulfills a portion of the social science gen ed requirement)	3
FIN 311	PRINCIPLES OF FINANCE	3
FIN 321	INVESTMENTS	3
Additional requirements for the Finance minor		
ACCT 210	INTRODUCTION TO FINANCIAL ACCOUNTING	3
FIN 301	MONEY AND BANKING	3
FIN 3XX	FINANCE ELECTIVE	3
Computer science minor		
CST 150	COMPUTER SCIENCE I	4
CST 250	COMPUTER SCIENCE II [recommended]	4
CST 2XX	COMPUTER SCIENCE ELECTIVE	3
CST 309	DATA MINING (Can count either in CST minor or as an ACSC elective, but not both) [recommended]	3
CST 333	DATABASE SYSTEMS [recommended]	3
General Education, University Writing Requirement, and Elective courses		44
Total Credit Hours		**120**

CORE Requirements (General Education)

Code	Title	Credit Hours
First Year Success Course or Transfer Success Course		
FYS 101	FIRST YEAR SUCCESS COURSE	1
or TRS 101	TRANSFER SUCCESS 101	
Communication Requirement		
ENG 101	COMPOSITION I: CRITICAL READING & WRITING	3
ENG 102	COMPOSITION II: INTRODUCTION TO ACADEMIC RESEARCH	3
COMM 101	PUBLIC SPEAKING (or program specific CORE communications course)	3
Ideas of Social Justice		
3 credits in coursework categorized as Ideas.		3
Humanities and Fine and Performing Arts [2, 3]		
9 credits from the following subject areas: African-American Studies, Art History, English (excluding ENG 101 and ENG 102), History, Languages, Music, Philosophy, Theatre, Communication and Women's and Gender Studies		9
Mathematics		
MATH 110	QUANTITATIVE LITERACY (or above) [1]	3
Science		
One biological science and one physical science required (one must include a one credit lab).		7-8
Social Sciences [2,3]		
9 credits from the following subject areas: African-American Studies, Criminal Justice, Economics, History, Journalism, Philosophy, Political Science, Psychology, Sociology and Women's and Gender Studies		9
Experiential Learning		
6 credits from coursework categorized as Experiential Learning.		6
Total Credit Hours		**47-48**

[1] Higher level of Math may be required by major
[2] Coursework must come from outside of students' major discipline
[3] A maximum of 9 credits can be applied from a single discipline towards humanities and social science requirements

These quantitative requirements also apply to degrees.

- Students must earn a minimum of 120 semester hours.
- Students may apply no more than 60 credit hours of 100-level courses toward the degree.
- Students must apply no fewer than 60 credit hours of 200- and 300-level courses toward the degree.

- Students must have at least 18 credit hours (of the 60 credit hours above) at the 300 level.
- Students may transfer in no more than 70 credit hours from community colleges.
- Students earning less than 60 total hours in residence must take their final 30 hours at Roosevelt University. Note that some majors have additional requirements for RU hours.
- Students must have a grade point average of 2.0 or higher to graduate. Note that some majors have additional GPA requirements.
- Students may apply no more than 51 hours in the major (BA) or 57 hours in the major (BS)

Requirements for MS degree

Three of the graduate courses(MATH 448 PROBABILITY AND STATISTICS II MATH 449 REGRESSION & TIME SERIES, and MATH 480P ACTUARIAL SCI SEM: EXAM P/1 or MATH 480FM ACTUARIAL SCIENCE SEMINAR) must be taken during the senior year of undergraduate and will be used for graduate credit in the MS.

Code	Title	Credit Hours
Core		
MATH 448	PROBABILITY AND STATISTICS II	3
MATH 480FM	ACTUARIAL SCIENCE SEMINAR	3
MATH 480P	ACTUARIAL SCI SEM: EXAM P/1	3
Electives		
Select four of the following: [2]		12
MATH 409	DATA MINING	
MATH 430	NUMERICAL ANALYSIS [1]	
MATH 446	STOCHASTIC PROCESSES [1]	
MATH 447	ADVANCED PROBABILITY [1]	
MATH 449	REGRESSION & TIME SERIES [1]	
MATH 457	ANOVA & EXPERIMENTAL DESIGN [1]	
MATH 469	ACTUARIAL MATHEMATICS I [1]	
MATH 470	ACTUARIAL MATHEMATICS II [1]	
MATH 475	DERIVATIVES MARKETS [1]	
MATH 476	LOSS MODELS	
MATH 478	TOPICS IN ACTUARIAL MATH [1]	
MATH 489	SPECIAL TOPICS	
MATH 495	INDEPENDENT STUDY	
Select up to four of the following courses with the remaining in mathematics or in approved cognate fields: [2]		12
ECON 421	MACROECONOMIC THEORY [1]	
ECON 423	MICROECONOMIC THEORY [1]	
FIN 408	FINANCE FOR DECISION MAKERS [1]	
FIN 485	INVESTMENT THEORY [1]	
Total Credit Hours		**33**

[1] At least six courses must be listed exclusively at the graduate level.
[2] Substitutions may be made with advisor approval.

Year 1

Fall	Credit Hours	Spring	Credit Hours
FYS 101	1	Ideas of Social Justice	3
ENG 101	3	ENG 102	3
ECON 101	3	ECON 102	3
Physical Science[6]	3	CST 150	4
MATH 121[7]	3	MATH 122	3
ACSC 101	1		
	14		**16**

Year 2

Fall	Credit Hours	Spring	Credit Hours
ACCT 210	3	FIN 301	3
MATH 231	5	MATH 232	5
Humanities #1	3	ACSC 246	3
COMM 101	3	BIOL 111 or 112 (and lab)[6]	4
Social Science #3 (ECON 234 recommended)	3		
	17		**15**

Year 3

Fall	Credit Hours	Spring	Credit Hours
MATH 233	3	Experiential Learning Course[3]	3
FIN 311	3	CST 250	4
Humanities #2	3	FIN 321	3
CST 2XX	3	MATH 480P	3
ACSC 347	3	MATH 448	3
	15		**16**

Year 4

Fall	Credit Hours	Spring	Credit Hours
MATH 449 (EXL #2)	3	CST 333	3
FIN 3XX[2]	3	ACSC 380FM	3
General Elective	3	ACSC elective	3
ACSC 367	3	General Elective	3
		Humanities #3	3
	12		**15**

Year 5

Fall	Credit Hours	Spring	Credit Hours
MATH 4XX	3	MATH 4XX	3
MATH 409[4]	3	MATH 4XX	3
MATH 446 or 447[4]	3	MATH 469[4]	3
MATH 4XX	3	MATH 475[4]	3
	12		**12**

Total Credit Hours 144

[1] Or any 300-level ACSC Course
[2] Any 300-level FIN course
[3] ACSC 390 recommended
[4] Or other Math 4XX course
[5] Students must take a professional exam, ideally during their junior year.
[6] One Natural Science course must be a lab course.
[7] Students should begin taking the calculus sequence in order based on their placement. Students who place into Math 122, 231, 232, or 233

should begin in that course in their first semester, taking subsequent courses each following semester until this sequence is complete.