ACTUARIAL SCIENCE, BA

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.

Actuarial Science involves applying probability theory and risk management to the areas of life and health insurance, property and casualty insurance, pension plans, and other employee benefit plans. Risk analysts and actuaries, who evaluate the long-term financial impact of these plans on both the issuing company and the purchaser or beneficiary of the plan, are employed by insurance companies, consulting firms, large corporations, and governmental agencies. The major in actuarial science emphasizes the mathematical theory that underlies risk evaluation.

Admission

Advanced placement in mathematics is possible for well-prepared students.

Standards

All courses presented for the major and the minor(s) must be completed with C- or higher grades with an overall GPA of 2.0 or higher. A maximum of two grades of C- may be presented for the major. Repeated courses in the major or minor require specific approval of the department chair. The average grade for all courses taken in actuarial science and mathematics must be C- or higher. Note that although the major only requires a grade of C- or above for graduation, ECON 101 PRINCIPLES OF ECONOMICS I, ECON 102 PRINCIPLES OF ECONOMICS II, FIN 311 PRINCIPLES OF FINANCE, FIN 321 INVESTMENTS, and ACSC 348 MATHEMATICAL STATISTICS must be passed with a grade of B- or above to fulfill Validation by Educational Experience (VEE) requirements for the CAS (Casualty Actuarial Society) and the SOA (Society of Actuaries). Students with a grade of C+ or below in ECON 101 PRINCIPLES OF ECONOMICS I, ECON 102 PRINCIPLES OF ECONOMICS II, FIN 311 PRINCIPLES OF FINANCE, FIN 321 INVESTMENTS, or ACSC 348 MATHEMATICAL STATISTICS are strongly encouraged to retake the course to earn a grade of B- or above.

Requirements

- At least four courses in Actuarial Science must be completed at Roosevelt University.
- All courses presented for the major must be completed with C- or higher grades with an overall GPA of 2.0 or higher. A maximum of two grades of C- may be presented for the major.
- The BA degree requires a Finance minor (for non-Business majors) (https://catalog.roosevelt.edu/undergraduate/business/minor/finance-minor-non-business-majors/).
- Students completing a Bachelor of Arts degree in Actuarial Science must take at least one professional exam prior to graduation. Proof should be submitted to the chair.
- All credit must be approved by the department to be applied toward the major.

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, which 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 ACSC 380P ACTUARIAL SCIENCE SEMINAR: EXAM P/1 aid in exam prep.
- ACSC 390 INDUSTRIAL RESEARCH PROBLEMS is recommended as an experiential learning course, as is ACSC 349 REGRESSION & TIME SERIES.
- ACSC 348 MATHEMATICAL STATISTICS satisfies the Mathematical Statistics VEE requirement provided a student earns a grade of B- or higher.
- Students are encouraged to do an actuarial, financial, programming, or statistical internship prior to graduation.

The major sequence for the Bachelor of Arts degree is given below.

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	3
ACSC 349	REGRESSION & TIME SERIES	3
ACSC 367	FINANCIAL MATH	3
ACSC 380FM	ACTUARIAL SCIENCE SEMINAR:EXAM FM/2	3
or ACSC 380P	ACTUARIAL SCIENCE SEMINAR: EXAM P/1	
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	
ACSC 390	INDUSTRIAL RESEARCH PROBLEMS ((EXL course))	

Required Programming Course		
CST 150	COMPUTER SCIENCE I	4
VEE requirement (part of Finance minor)		
ECON 101	PRINCIPLES OF ECONOMICS I (fulfills portion of social science gen ed requirement)	3
ECON 102	PRINCIPLES OF ECONOMICS II (fulfills portion of social science gen ed requirement)	3
FIN 311	PRINCIPLES OF FINANCE	3
FIN 321	INVESTMENTS	3
Additional Courses for the Finance Minor		
ACCT 210	INTRODUCTION TO FINANCIAL ACCOUNTING	3
FIN 301	MONEY AND BANKING	3
FIN 3XX		3
General Education, University Writing Requirement, and Electives		57
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, 4]		
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
4 Digital Advertising and Public Relations Majors must complete COMM 110 with a grade of C or higher. This course can fulfill one Social Science requirement.

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)

Your degree map is a general guide suggesting courses to complete each term on the academic pathway to your degree. It is based on the most current scheduling information from your academic program. Your program's degree map is reviewed annually and updated as schedules change (although you retain the same course requirements as long as you are continuously enrolled in your degree program).

Students should begin and continue in the calculus sequence: MATH 121 COLLEGE ALGEBRA, MATH 122 TRIGONOMETRY AND PRECALCULUS, MATH 231 CALCULUS I, MATH 232 CALCULUS II, MATH 233 CALCULUS III . Students should take ACSC 367 FINANCIAL MATH and ACSC 347 PROBABILITY THEORY as soon as they compete MATH 232 CALCULUS II; note that ACSC 367 FINANCIAL MATH is offered in odd-numbered fall terms, and ACSC 347 PROBABILITY THEORY is offered in even numbered fall terms.

Always work closely with your academic advisor to understand curriculum requirements and scheduling, as each student's academic plan can look slightly different.

Year 1

Fall	Credit Hours	Spring	Credit Hours
ENG 101	3	ENG 102	3
MATH 121[5]	3	Ideas of Social Justice	3
ACSC 101	1	CST 150[5]	4
Physical Science[2]	3	MATH 122	3
FYS 101	1	ACCT 210	3
ECON 101	3		
	14		**16**

Year 2

Fall	Credit Hours	Spring	Credit Hours
ECON 102	3	ACSC 246	3
MATH 231[5]	5	FIN 301	3
Humanities #1	3	FIN 311	3
COMM 101	3	MATH 232[5]	5
Social Science #3 (ECON 234 recommended)	3		
	17		**14**

Year 3

Fall	Credit Hours	Spring	Credit Hours
MATH 233[5]	3	ACSC 380FM or 380P	3
ACSC 367[6]	3	FIN 321	3
General Elective[1]	3	Humanities #2	3
ACSC 347[6]	3	ACSC 348	3
ACSC 3XX[3]	3	Experiential Learning #1[4]	3
	15		**15**

Year 4

Fall	Credit Hours	Spring	Credit Hours
BIOL 111 or 112[2]	4	ACSC 3XX[3]	3
Humanities #3	3	General Elective[1]	3
FIN 3XX[3]	3	General Elective[1]	3
ACSC 349 (EXL course)	3	General Elective[1]	3
General Elective[1]	3	General Elective	1
	16		**13**

Total Credit Hours 120

A three-year degree plan is shown below for the well-prepared student who has the time available to take 18-credits in the fall and spring terms as well as the ability to take summer courses.

Year 1

Fall	Credit Hours	Spring	Credit Hours	Summer	Credit Hours
ENG 101	3	ENG 102	3	Social Science #3	3
ACCT 210	3	Ideas of Social Justice	3	Physical Science[3]	3
ACSC 101	1	CST 150	4		
FYS 101	1	MATH 232	5		
MATH 231	5	ECON 102	3		
ECON 101	3				
	16		**18**		**6**

Year 2

Fall	Credit Hours	Spring	Credit Hours	Summer	Credit Hours
MATH 233	3	ACSC 246	3	FIN 398 or ACSC 395	3
COMM 101	3	ACSC 348	3		
FIN 311	3	FIN 321	3		
ACSC 347	3	ACSC 380FM	3		
ACSC 367	3	General Elective	3		
FIN 301	3	Experiential Learning #1 (ACSC 390 suggested)[4]	3		
	18		**18**		**3**

Year 3

Fall	Credit Hours	Spring	Credit Hours	Summer	Credit Hours
ACSC 349 (EXL course)	3	Humanities Course #2	3	General Elective	3
ACSC 3XX[3]	3	ACSC 3XX[3]	3	General Elective	3
FIN 3XX[3]	3	Humanities Course #3	3		
BIOL 111[2]	4	General Elective[1]	3		
Humanities #1	3	General Elective[1]	3		
General Elective[1]	1	General Elective[1]	3		
	17		**18**		**6**

Total Credit Hours 120

1. Or course towards an optional Minor.
2. One Natural Science course must have a lab.
3. Any course at the 300 Level within the discipline.
4. Experiential Learning class must be 200/300 level. Students are encouraged to take ACSC 390 INDUSTRIAL RESEARCH PROBLEMS along with the required ACSC 349 REGRESSION & TIME SERIES course to satisfy their Experiential Learning requirements.
5. Where a student begins their math sequence depends on their placement, and so some students will start in MATH 231 CALCULUS I instead. Students should take this sequence of courses each semester until they complete MATH 232 CALCULUS II; they should take MATH 233 CALCULUS III in the next possible fall term.
6. ACSC 347 PROBABILITY THEORY and ACSC 367 FINANCIAL MATH should be taken in the first fall term that occurs after a student completes MATH 232 CALCULUS II.