

# ACTUARIAL SCIENCE, BS

Risk analysts and actuaries are expected to 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 for 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 and 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 applied statistics.

Actuarial Science involves the application of 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 grades of C- or higher with an overall GPA of 2.0 in the major. 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 349 REGRESSION & TIME SERIES must be passed with a grade of B- or above in order to fulfill VEE (Validation by Educational Experience) requirements for the CAS (Casualty Actuarial Society) and the SOA (Society of Actuaries). Students with a grade of C+ or below in any of ECON 101 PRINCIPLES OF ECONOMICS I, ECON 102 PRINCIPLES OF ECONOMICS II, FIN 311 PRINCIPLES OF FINANCE, FIN 321 INVESTMENTS, or ACSC 349 REGRESSION & TIME SERIES are strongly encouraged to retake the course in order to earn a grade of B- or above.

## 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 science minor or supporting sequence will result in at least 60 semester hours.)

- The BS degree requires both a minor in Finance (<http://catalog.roosevelt.edu/undergraduate/business/finance-minor-non-business-majors>) and an additional minor or 15 credit hour supporting sequence in a science. Computer Science is strongly recommended. Approved areas for the BS degree are:
  - Biology (<http://catalog.roosevelt.edu/undergraduate/arts-sciences/biology-minor>)
  - Chemistry (<http://catalog.roosevelt.edu/undergraduate/arts-sciences/chemistry-minor>)
  - Computer Science (<http://catalog.roosevelt.edu/undergraduate/arts-sciences/computer-science-minor>) (courses must be above CST 115 DIGITAL MEDIACRAFT, A&S)
  - Physical Science (courses must be at or above PHSC 103 GLOBAL CLIMATE CHANGE)
  - Physics
  - Psychology (<http://catalog.roosevelt.edu/undergraduate/arts-sciences/psychology-minor>)

## Recommendations

- Appropriate supporting courses in computer science, economics, and finance are recommended.
- The one-credit course ACSC 101 ACTUARIAL CAREER is strongly recommended for all majors.
- Students should prepare to take an actuarial professional exam early in their degree plan, as this is often a requirement for actuarial internships.
- Students are encouraged to do an actuarial, financial, or statistical internship prior to graduation.

### Core

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	
CST 150	COMPUTER SCIENCE I	4
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	
<b>VEE requirement (part of Finance minor)</b>		
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		9
<b>Additional science minor or supporting sequence requirements</b>		
Select five sequence courses in an area of science other than MATH (computer science is recommended)		15
CST 150	COMPUTER SCIENCE I	
CST 250	COMPUTER SCIENCE II	
CST 2XX	COMPUTER SCIENCE ELECTIVE	
CST 309	DATA MINING (Can count either in CST minor or as an ACSC elective, but not both)	
CST 333	DATABASE SYSTEMS	
General Education, University Writing Requirement, and Elective courses		43
Total Credit Hours		120

## General Education Requirements

Code	Title	Credit Hours
<b>Academic Communities of Practice</b>		
ACP 101	FIRST YEAR SEMINAR <sup>1</sup>	3
ACP 110	PRIMARY TEXTS	3
ACP 250	FOUNDATIONS FOR CHANGE	3
<b>English Composition <sup>2</sup></b>		
ENG 101	COMPOSITION I: CRITICAL READING & WRITING	3
ENG 102	COMPOSITION II: INTRODUCTION TO ACADEMIC RESEARCH	3
<b>Humanities</b>		
Select 9 credits from the following subject areas: African-American Studies, Art History, English (excluding ENG 101 and ENG 102), History, Languages, Music, Philosophy, Theatre, Speech and Women's and Gender Studies		9
<b>Mathematics</b>		
MATH 110	QUANTITATIVE LITERACY (or above) <sup>3</sup>	3
<b>Non-Western requirement</b>		
Non-Western course (can be used for Humanities or Social Sciences general education requirements)		3
<b>RU mission-related course <sup>2</sup></b>		
LIBS 201	WRITING SOCIAL JUSTICE	3
<b>Science</b>		
One biological science and one physical science required (at least one must be a four-hour lab (not applicable for science majors)		7-8

<b>Social Sciences</b>	
Select 9 credits from the following subject areas: African-American Studies, Anthropology, Economics, History, Journalism, Philosophy, Political Science, Psychology, Sociology and Women's and Gender Studies	9
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Total Credit Hours	49-50

- <sup>1</sup> Required for students who enter RU with fewer than 12 credit hours  
<sup>2</sup> Minimum grade of C- required  
<sup>3</sup> Math, Computer Science & Technology, and Science majors have different requirements--see advisor

These quantitative requirements also apply to degrees in the College of Arts and Sciences:

- 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 66 credit hours from community colleges.
- Students 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 must have a minimum of 90 hours in Arts and Sciences.
- 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).

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

<b>Year 1</b>			
Fall	Credit Hours	Spring	Credit Hours
ACP 101	3	ACP 110	3
ENG 101	3	ENG 102	3
ACCT 210	3	ECON 101	3
MATH 121	3	CST 150	4
ACSC 101	1	MATH 122	3
Physical Science <sup>5</sup>	3		
		16	16

<b>Year 2</b>			
Fall	Credit Hours	Spring	Credit Hours
LIBS 201 or ACP 250	3	ACP 250 or LIBS 201	3
ECON 102	3	FIN 301	3
MATH 231	5	MATH 232	5

ECON 234	3 ACSC 246	3
	14	14

**Year 3**

Fall	Credit Hours Spring	Credit Hours
MATH 233	3 ACSC 380FM	3
ACSC 367	3 ACSC 3XX	3
FIN 311	3 FIN 321	3
ACSC 349	3 Humanities Course #1	3
Science Minor or Sequence	3 Science Minor or Sequence	3
	15	15

**Year 4**

Fall	Credit Hours Spring	Credit Hours
ACSC 347	3 ACSC 348	3
FIN 387 or FIN 3XX	3 ACSC 380P or ACSC 3XX	3
Non-Western Humanities Course <sup>4</sup>	3 Humanities Course #3	3
Biological Science <sup>5</sup>	4 Science Minor or Sequence	3
Science Minor or Sequence	3 General Elective <sup>1</sup>	3
	16	15

Total Credit Hours 121

<sup>1</sup> Or course towards a Minor.<sup>2</sup> Any course at the 200 Level within the discipline<sup>3</sup> Any course at the 300 Level within the discipline.<sup>4</sup> This requirement can be fulfilled by other requirements.<sup>5</sup> One Natural Science course must have a lab.