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 and corporate finance.

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, and FIN 321 INVESTMENTS 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, or FIN 321 INVESTMENTS are strongly encouraged to retake the course in order to earn a grade of B- or above. Students working on the Statistics VEE are encouraged to discuss this with their advisor to make sure their courses align with the SOA’s new VEE transition rules.

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.
- 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 ACSC 380P ACTUARIAL SCIENCE SEMINAR: EXAM P/1 aid in exam preparation.
- Students are encouraged to take ACSC 390 INDUSTRIAL RESEARCH PROBLEMS and ECON 235 ELEMENTARY STATISTICS LAB as part of their experiential learning coursework.
- Students are encouraged to do an actuarial, computing, financial, or statistical internship prior to graduation.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>ACSC 101</td>
<td>ACTUARIAL CAREER</td>
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<td>MATH 231</td>
<td>CALCULUS I</td>
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<td>MATH 232</td>
<td>CALCULUS II</td>
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<td>CALCULUS III</td>
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<td>ACSC 246</td>
<td>LINEAR ALGEBRA</td>
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<td>ACSC 347</td>
<td>PROBABILITY THEORY</td>
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<td>ACSC 348</td>
<td>MATHEMATICAL STATISTICS</td>
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<td>ACSC 349</td>
<td>REGRESSION &amp; TIME SERIES</td>
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<td>ACSC 367</td>
<td>FINANCIAL MATH</td>
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<tr>
<td>ACSC 380FM</td>
<td>ACTUARIAL SCIENCE SEMINAR: EXAM FM/2</td>
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<td>or ACSC 380P</td>
<td>ACTUARIAL SCIENCE SEMINAR: EXAM P/1</td>
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<tr>
<td>CST 150</td>
<td>COMPUTER SCIENCE I</td>
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<tr>
<td>ACSC 390</td>
<td>DATA MINING</td>
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Select two of the following:
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 380 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 9

Additional science minor or supporting sequence requirements
Select five sequence courses in an area of science other than MATH (computer science is recommended) 15
CST 150  COMPUTER SCIENCE I 4
CST 250  COMPUTER SCIENCE II 3
CST 2XX  COMPUTER SCIENCE ELECTIVE 3
CST 309  DATA MINING (Can count either in CST minor or as an ACSC elective, but not both) 3
CST 333  DATABASE SYSTEMS 3

General Education, University Writing Requirement, and Elective courses 43

Total Credit Hours 121

**CORE Requirements (General Education)**

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<td>or TRS 101</td>
<td>TRANSFER SUCCESS 101</td>
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**Communication Requirement**

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<tr>
<td>ENG 101</td>
<td>COMPOSITION I: CRITICAL READING &amp; WRITING</td>
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<tr>
<td>ENG 102</td>
<td>COMPOSITION II: INTRODUCTION TO ACADEMIC RESEARCH</td>
<td>3</td>
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<tr>
<td>LIBS 201</td>
<td>WRITING SOCIAL JUSTICE (Transfer students with acceptable communication credit may be exempt from this requirement.)</td>
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</table>

**Ideas Across Disciplines**

3 credits in coursework categorized as Ideas. 3

**Humanities and Fine and Performing Arts**

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

**Mathematics**

<table>
<thead>
<tr>
<th>Code</th>
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<tr>
<td>MATH 110</td>
<td>QUANTITATIVE LITERACY (or above)</td>
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**Science**

One biological science and one physical science required (at least one must be a four-hour lab). (Not applicable for science majors) 7-8

**Social Sciences**

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

**Experiential Learning**

6 credits from coursework categorized as Experiential Learning. 6

Total Credit Hours 41-42

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

- 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 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).

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**

<table>
<thead>
<tr>
<th>Fall</th>
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<th>Spring</th>
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<td>ENG 102</td>
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<td>ECON 101</td>
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<td>MATH 233</td>
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<td>FIN 321</td>
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<td>General Elective&lt;sup&gt;1&lt;/sup&gt;</td>
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<td>ACSC 348</td>
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<td>ACSC 3XX&lt;sup&gt;3&lt;/sup&gt;</td>
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<td>Humanities Course #3</td>
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</table>

Total Credit Hours 120

<sup>1</sup> Or course towards a Minor.

<sup>2</sup> One Natural Science course must have a lab.

<sup>3</sup> Any course at the 300 Level within the discipline.

<sup>4</sup> Experiential Learning class must be 200/300 level. Students are encouraged to take ACSC 390 and ECON 234/235 sequence to satisfy their Experiential Learning requirements.