ACTUARIAL SCIENCE (CAS)

Description

Website: business.unl.edu/academic-programs/departments/finance/actuarial-science (http://business.unl.edu/academic-programs/departments/finance/actuarial-science/)

An actuary is a mathematically oriented professional who will most likely be a manager or supervisor at some point in their career. A major in actuarial science is an excellent educational background for prospective actuaries. The actuarial science program is designed to prepare students for the current industry demands. All actuarial science students are encouraged to visit the actuarial science program's website and an actuarial science program faculty member for more information about the program, including the Actuarial Science Club, sequencing of courses, scholarship opportunities, and the requirements for achieving professional actuarial designations.

Learning Outcomes

Graduates of actuarial science will be able to:

1. Demonstrate the ability to apply the concept of actuarial science in solving problems related to financial security.
2. Understand the content of the UNL courses that have been approved for the actuarial profession's Validation by Educational Experience (VEE) program for the topics of Economics, Corporate Finance, and Applied Statistics.
3. Understand the additional considerations in practical applications of actuarial theory, such as assumption setting, Actuarial Standards of Practice, the professional code of conduct, and effective communication.
4. Understand that being a professional requires that actuarial tasks be completed with the highest regard for personal and professional ethics.
5. Demonstrate the ability to transition from actuarial theory to actuarial practice and the ability to apply tools that actuaries use in practice to complete actuarial tasks, such as a modern procedural computer programming language, Excel or similar spreadsheet program, and commercially available actuarial software.
6. Demonstrate the ability to communicate the results of quantitative analysis effectively, both in writing and orally.
7. Demonstrate the ability to work cooperatively with others.
8. Understand what is involved in being a member of the actuarial profession, including the types of employment available in an actuarial career and the requirements to become, and remain, a member of the actuarial profession.
9. Demonstrate the ability to be productive in one or more actuarial roles, including: a. current or developing areas of actuarial practice; b. research designed to deepen or broaden actuarial knowledge; or c. education of aspiring or practicing actuaries.

Academic and Career Advising

Academic and Career Advising Center

Not sure where to go or who to ask? The Advising Center team in 107 Oldfather Hall can help. The Academic and Career Advising Center is the undergraduate hub for CAS students in all majors. Centrally located and easily accessed, students encounter friendly, knowledgeable people who are eager to help or connect students to partner resources. Students also visit the Advising Center in 107 Oldfather Hall to:

- Choose or change their major, minor, or degree program.
- Check on policies, procedures, and deadlines.
- Get a college approval signature from the Dean's representatives.

CAS Career Coaches are available by appointment (in-person or Zoom) and located in the CAS Academic and Career Advising Center, 107 Oldfather Hall. They help students explore majors and minors, gain experience, and develop a plan for life after graduation.

Assigned Academic Advisors

Academic advisors are critical resources dedicated to students' academic, personal, and professional success. Every CAS student is assigned an academic advisor based on their primary major. Since most CAS students have more than just a single major, it is important to get to know the advisor for any minors or additional majors. Academic advisors work closely with the faculty to provide the best overall support and the discipline specific expertise. They are available for appointments (in-person or Zoom) and through weekly virtual drop-ins. Assigned advisors are listed in MyRED (https://its.unl.edu/myunl/) and their offices may be located in or near the department of the major for which they advise.

Students who have declared a pre-health or pre-law area of interest will also work with advisors in the Exploratory and Pre-Professional Advising Center (Explore Center) in 127 Love South, who are specially trained to guide students preparing to enter a professional school.

For complete and current information on advisors for majors, minors, or pre-professional areas, visit https://cas.unl.edu/major-advisors (https://cas.unl.edu/major-advisors/), or connect with the Arts and Sciences Academic and Career Advising Center, 107 Oldfather Hall, 402-472-4190, casadvising@unl.edu.

Career Coaching

The College believes that **Academics + Experience = Opportunities** and encourages students to complement their academic preparation with real-world experience, including internships, research, education abroad, service, and leadership. Arts and sciences students have access to a powerful network of faculty, staff, and advisors dedicated to providing information and support for their goals of meaningful employment or advanced education. Arts and sciences graduates have unlimited career possibilities and carry with them important career competencies—communication, critical thinking, creativity, context, and collaboration. They have the skills and adaptability that employers universally value. Graduates are prepared to effectively contribute professionally and personally with a solid foundation to excel in an increasingly global, technological, and interdisciplinary world.

Students should contact the career coaches in the Arts and Sciences Academic and Career Advising Center in 107 Oldfather Hall, or their assigned advisor, for more information. The CAS career coaches help students explore career options, identify ways to build experience and prepare to apply for internships, jobs, or graduate school, including help with resumes, applications, and interviewing.

ACE Requirements

Students must complete one course for each of the ACE Student Learning Outcomes below. Certified course choices are published in

the degree audit, or visit the ACE (http://ace.unl.edu) website (http://ace.unl.edu) for the most current list of certified courses.

ACE Student Learning Outcomes

ACE 1: Write texts, in various forms, with an identified purpose, that respond to specific audience needs, integrate research or existing knowledge, and use applicable documentation and appropriate conventions of format and structure.

ACE 2: Demonstrate competence in communication skills.

ACE 3: Use mathematical, computational, statistical, logical, or other formal reasoning to solve problems, draw inferences, justify conclusions, and determine reasonableness.

ACE 4: Use scientific methods and knowledge to pose questions, frame hypotheses, interpret data, and evaluate whether conclusions about the natural and physical world are reasonable.

ACE 5: Use knowledge, historical perspectives, analysis, interpretation, critical evaluation, and the standards of evidence appropriate to the humanities to address problems and issues.

ACE 6: Use knowledge, theories, and research perspectives such as statistical methods or observational accounts appropriate to the social sciences to understand and evaluate social systems or human behaviors.

ACE 7: Use knowledge, theories, or methods appropriate to the arts to understand their context and significance.

ACE 8: Use knowledge, theories, and analysis to explain ethical principles and their importance in society.

ACE 9: Exhibit global awareness or knowledge of human diversity through analysis of an issue.

ACE 10: Generate a creative or scholarly product that requires broad knowledge, appropriate technical proficiency, information collection, synthesis, interpretation, presentation, and reflection.

College Degree Requirements
College Distribution Requirements

The College of Arts and Sciences distribution requirements are designed to ensure a range of courses across disciplines within the College. Students develop the ability to learn in a variety of ways and apply their knowledge from a variety of perspectives. All requirements are in addition to University ACE requirements, and no course can be used to fulfill both an ACE outcome and a College Distribution Requirement.

- A student may not use a single course to satisfy more than one College Distribution Requirement, with the exception of CDR Diversity. Courses used to meet CDR Diversity may also meet CDR Writing, CDR Humanities, or CDR Social Science.
- Internship (395 or 495), independent study or readings (396 or 496), research (398 or 498), and thesis (399, 399H, 499, or 499H) will not satisfy distribution requirements.
- Other courses with a 9 in the middle number (ex. PSYC 292) will not satisfy distribution requirements unless approved by an advisor.
- Cross-listed courses from interdisciplinary programs will be applied in the same area as courses from the lead department.

CDR: Written Communication

Select from courses approved for ACE outcome 1.

CDR: Natural, Physical, and Mathematical Sciences [1]

Select a course from ASTR, BIOS, CHEM, GEOL, LIFE, METR, MATH, PHYS, or ANTH 242, GEOG 155, GEOG 281, POLS 250, or PSYC 273.

CDR: Laboratory [2]

Laboratory courses may be embedded in a 4-5 credit course used in CDR Natural, Physical, and Mathematical Science (example GEOG 155), or stand alone (example LIFE 120L).

CDR: Humanities [3]

Select a course from ARAB, CHIN, CLAS, CZEC, ENGL, FILM, FREN, GERM, GREK, HIST, JAPN, LATN, PHIL, RELG, RUSS, or SPAN.

CDR: Social Science [4]

Select a course from ANTH, COMM, GEOG, NSST, POLS, PSYC, or SOCI.

CDR: Human Diversity in U.S. Communities

Select from the following approved courses also listed in your degree audit: ANTH 130, ANTH 412, ANTH 447, ANTH 473, ARAB/RELG 313, COMM 311, COMM 315, COMM/ETHN 335, COMM 364, COMM/ETHN 365, COMM 465, ENGL/WMNS 212, ENGL/ETHN 245N, ENGL/WMNS 312, ENGL/ETHN 345D, ENGL/ETHN/WMNS 345N, ENGL/ETHN 346, ENGL 376, ENGL 380, ENGL/ETHN 445, ETHN 100, ETHN 201, ETHN 202, ETHN 204, ETHN 484, FILM/ETHN 344, GEOG 271, GEOG 403, GLST/ANTH/MODL 214, GLST 350, HIST/ETHN/WMNS 115, HIST/ETHN 234, HIST/ETHN 246, HIST 251, HIST/ETHN 340, HIST 351/ETHN 341, HIST/ETHN/WMNS 356, HIST/ETHN 357, HIST/WMNS 402, HRHA 350, MODL 260, PHIL 105, PHIL 106, PHIL/WMNS 218, PHIL 323, PHIL 325, POLS/ETHN 333, POLS/WMNS 338, POLS 340, POLS 347, POLS 433, PSYC/ETHN 310, PSYC 330, PSYC/WMNS 421, PSYC/ETHN 425, RELG/HIST 134, RELG/ETHN/HIST 226, RELG/HIST 227, SOCI 101, SOCI 180, SOCI/WMNS 200, SOCI/ETHN 217, SPAN 206, SPAN 486, WMNS 101, WMNS 201, WMNS 202, WMNS 210

CDR: Language

BA Students [5]

Fulfilled by the completion of the 4th level of a single language (either in H.S. or in college). Language study at UNL is available in: ARAB, CHIN, CZEC, FREN, GERM, GREK, JAPN, LATN, SPAN, or SLPA.

BS Students [6]

Fulfilled by the completion of the 2nd level of a single language (either in H.S. or in college). Language study at UNL is available in: ARAB, CHIN, CZEC, FREN, GERM, GREK, JAPN, LATN, SPAN, or SLPA.

[1] *Excluded courses:* BIOC 101, BIOS 100, BIOS 180, CHEM 101, MBIO 101, PHYS 201, MATH 100A, MATH 101, MATH 101P, MATH 102, MATH 103, *and MATH subject area credit at the 100 level or below.*

[2] ANTH 242L, ASTR 224, BIOS 101L, BIOS 110L, BIOS 111, BIOS 116, BIOS 213L, BIOS 214, CHEM 105L, CHEM 106L, CHEM 109L, CHEM 110L, CHEM 113L, GEOG 155, GEOL 101, GEOL 103, LIFE 120L, LIFE 121L, METR 100, PHYS 141, PHYS 142, PHYS 153, PHYS 221, *or* PHYS 222.

[3] *ARAB, CHIN, CZEC, FREN, GERM, GREK, JAPN, LATN, and SPAN courses must be numbered 300 or above. ENGL courses must be* ENGL 170,

ENGL 180, *or ENGL 200 level and above. Excluded courses:* CLAS 116, ENGL 254, ENGL 300, ENGL 354, SPAN 300A, SPAN 303, *and* SPAN 304.

[4] *Excluded courses:* ANTH 242/ANTH 242L, GEOG 155, GIST 111, GIST 311, POLS 101, POLS 250, PSYC 100, PSYC 273.

[5] ARAB 202, CHIN 202, CZEC 202, FREN 202 *or* FREN 210, GERM 202, GREK 301 *and* GREK 302, JAPN 201 *and* JAPN 202, LATN 301 *and* LATN 302, SPAN 202 *or* SPAN 210 *or* SPAN 300A *or* SLPA 202.

[6] ARAB 102, CHIN 102, CZEC 102, FREN 102, GERM 102, GREK 102 *or* GREK 151, JAPN 102, LATN 102, SPAN 102 *or* SPAN 110 *or* SPAN 300A, *or* SLPA 102.

Language Requirement

The University of Nebraska–Lincoln and the College of Arts and Sciences place great value on academic exposure and proficiency in a second language. The University of Nebraska–Lincoln entrance requirement is successful completion of two levels of the same world language, and the College of Arts and Sciences degree requirement (CDR: Language) is proficiency through 4 levels for BA students, or 2 levels for BS students. Levels are defined as years in High School, or semesters in college as documented on an official transcript.

Students who believe they are proficient in a language, but who do not have academic records of that proficiency, should consult with their academic advisor to explore alternative assessments which may include a proficiency examination by a UNL faculty member for languages taught at UNL, or through an approved private service for languages not taught at UNL (expenses for this service would be the student's responsibility.)

Experiential Learning Requirement

All undergraduates in the College of Arts and Sciences must complete an Experiential Learning (EL) designated course. This may include 0-credit courses designed to document co-curricular activities recognized as Experiential Learning. Students should consult their assigned Academic Advisor and Career Coach for assistance identifying experiential learning opportunities relevant to their academic program, interests and goals.

The bachelor of science degree requires students to complete 60 hours in mathematical, physical, and natural sciences from disciplines within the College of Arts and Sciences or required in its majors: ACTS, ASTR, BIOC, BIOS, CHEM, CSCE, GEOL, LIFE, MBIO, METR, MATH, PHYS, STAT or ANTH 242 , ANTH 242L, ANTH 341, ANTH 385, ANTH 386, ANTH 389, ANTH 416, ANTH 422, ANTH 430, ANTH 442, ANTH 443, ANTH 444, ANTH 448, ANTH 473, ANTH 484, ANTH 487D, ENVR 201, GEOG 155, GEOG 217, GEOG 281, GEOG 308, GEOG 317, GEOG 408, GEOG 417, GEOG 418, GEOG 419, GEOG 421, GEOG 422, GEOG 425, GEOG 427, GEOG 432, GEOG 444, GEOG 461, GEOG 467, PHIL 211, POLS 250, PSYC 273, PSYC 368, PSYC 370, PSYC 450, PSYC 451, PSYC 456, PSYC 458,PSYC 460, PSYC 461, PSYC 463, PSYC 464, or PSYC 465.

Excluded courses include: BIOC 101, BIOS 100, BIOS 180, CHEM 101, MATH 100A, MATH 101, MATH 101P, MATH 102, MATH 103, MBIO 101, PHYS 201 as well as any course numbered 395, 495, 399, 399H, 499, or 499H. MATH subject area credit at the 100 level or below is also excluded.

Up to 12 hours of scientific and technical courses offered by other colleges may be accepted toward this requirement with approval of the College of Arts and Sciences. See your assigned academic advisor to start the approval process.

Minimum Hours Required for Graduation

A minimum of 120 semester hours of credit is required for graduation from the College of Arts and Sciences. A cumulative grade point average of at least 2.0 is required.

Grade Rules

Restrictions on C- and D Grades

The College will accept no more than 15 semester hours of C- and D grades from other domestic institutions except for UNO and UNK. All courses taken at UNO and UNK impact the UNL transcript. No transfer of C- and D grades can be applied toward requirements in a major or a minor. No University of Nebraska–Lincoln C- and D grades can be applied toward requirements in a major or a minor. International coursework (including education abroad) with a final grade equivalent to a C- or lower will not be validated by the College of Arts and Sciences departments to be degree applicable.

Pass/No Pass Privilege

University policy for the Pass/No Pass (P/N) privilege:

- Neither the P nor the N grade factor into your GPA.
- 'P' is interpreted to mean a grade of C or above. A grade of C- or lower results in a "N".
- A change to or from a Pass/No Pass may be made until mid-term (1/2 of the course - see the academic calendar for specific dates per term).
- The Pass/No Pass or grade registration cannot conflict with the policy of the professor, department, college, or University policy governing the grading options.
- Changing to or from the Pass/No Pass grading option requires using MyRED, or processing a Schedule Adjustment Form.
- For undergraduates, the University maximum of 24 'Pass' credit hours and/or college and department limits will apply. These limits do not include courses offered on a 'Pass/No Pass' basis only. Consult your advisor or the Undergraduate Catalog (https://catalog.unl.edu/ undergraduate/) for restrictions on the number of 'Pass' hours you can apply toward your degree.
- The 'Pass/No Pass' grading option cannot be used for the removal of 'C-', 'D+', 'D', 'D-', or 'F' grade factors.
  NOTE: See Course Repeats *(*https://registrar.unl.edu/academic-standards/course-repeats/*)*

College of Arts and Sciences policy on the Pass/No Pass (P/N) privilege:

- Pass hours can count toward fulfillment of University ACE requirements and college distribution requirements up to the 24-hour maximum.
- Most arts and sciences majors and minors do not permit any courses graded Pass/No Pass to apply, or limit them to no more than 6 hours. Students should refer to the major section of the catalog for clarification.
- Departments may specify that certain courses of theirs can be taken on a P/N-only or on a graded-only basis.

Grading Appeals

A student who feels that he/she has been unfairly graded must ordinarily take the following sequential steps in a timely manner, usually by initiating the appeal in the semester following the awarding of the grade:

1. Talk with the instructor concerned. Most problems are resolved at this point.
2. Talk to the instructor's department chairperson.

3. Take the case to the Grading Appeal Committee of the department concerned. The Committee should be contacted through the department chairperson.
4. Take the case to the College Grading Appeals Committee by contacting the Dean's Office, 1223 Oldfather Hall.

Course Level Requirements
Courses Numbered at the 300 or 400 Level
Thirty (30) of the 120 semester hours of credit must be in courses numbered at the 300 or 400 level. Of those 30 hours, 15 hours (1/2) must be completed in residence at the University of Nebraska–Lincoln.

Residency Requirement
The term "Residency" refers to courses taken at UNL. Students must complete at least 30 of the 120 total hours for their degree at the University of Nebraska–Lincoln. Students must complete at least 18 hours of their major coursework, and 15 of the 30 hours required at the 300 or 400 level, at UNL.

Catalog to Use
Students must fulfill the requirements stated in the catalog for the academic year in which they are first admitted to and enrolled as a degree-seeking student at the University of Nebraska–Lincoln. In consultation with advisors, a student may choose to follow a subsequent catalog for any academic year in which they are admitted to and enrolled as a degree-seeking student at the University of Nebraska–Lincoln in the College of Arts and Sciences. Students must complete all degree requirements from a single catalog year. Beginning in 1990-1991, the catalog which a student follows for degree requirements may not be more than 10 years old at the time of graduation.

Transfer Students: Students who have transferred from a community college may be eligible to fulfill the requirements as stated in the catalog for an academic year in which they were enrolled at the community college prior to attending the University of Nebraska-Lincoln. This decision should be made in consultation with academic advisors, provided the student a) was enrolled in a community college during the catalog year they are utilizing, b) maintained continuous enrollment at the previous institution for 1 academic year or more, and c) continued enrollment at the University of Nebraska-Lincoln within 1 calendar year from their last term at the previous institution. Students must complete all degree requirements from a single catalog year and within the time frame allowable for that catalog year.

Major Requirements
Core Requirements

Required Calculus Sequence

MATH 106	Calculus I	5
MATH 107	Calculus II	4
MATH 208	Calculus III	4
Credit Hours Subtotal:		13
Required Statistics Courses		
STAT 462	Introduction to Mathematical Statistics I: Distribution Theory	4
STAT 463	Introduction to Mathematical Statistics II: Statistical Inference	4
Credit Hours Subtotal:		8
Required Actuarial and Technical Skills Courses		

BSAD 50	Business Computer Applications	0
ACTS 250	Actuarial Technical Skills	3
ACTS 440	Interest Theory	3
ACTS 445	Introduction to Actuarial Models	3
ACTS 460	Short-Term Actuarial Mathematics	3
ACTS 470	Long-Term Actuarial Mathematics	3
ACTS 475	Actuarial Applications in Practice	3
FINA 338	Principles of Individual and Corporate Risk Management	3
SCMA 451	Introduction to Predictive Analytics	3
Credit Hours Subtotal:		24
Total Credit Hours		**45**

Specific Major Requirements
Elective Courses

Twelve (12) hours of additional ACTS 400 level courses, or courses from the following list:		12
FINA 412	Life and Health Insurance	
FINA 438	Enterprise Risk Management	
Credit Hours Subtotal:		12
Total Credit Hours		**12**

Additional Major Requirements
Grade Rules
C- and D Grades
A grade of C or above is required for all courses in the major and minor.

Pass/No Pass
No course taken Pass/No Pass will be counted toward the major except BSAD 50.

Requirements for Minor Offered By Department
At least twelve (12) hours of actuarial science as indicated below, plus prerequisite courses (MATH 106, MATH 107, MATH 208, STAT 380, and STAT 462).

Required Courses

ACTS 440	Interest Theory	3
ACTS 470	Long-Term Actuarial Mathematics	3
ACTS 475	Actuarial Applications in Practice	3
One additional ACTS course		3
Credit Hours Subtotal:		12
Total Credit Hours		**12**

Grade Rules
C- and D Grades
A grade of C or above is required for all courses in the major and minor.

Pass/No Pass
No course taken Pass/No Pass will be counted toward the major or minor.

ACTS 250 Actuarial Technical Skills
Prerequisites: BSAD 50
Description: Data organization, manipulation, and analysis using current software tools and programming languages to solve business problems of an actuarial nature.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded
Offered: FALL/SPR
Prerequisite for: FINA 361; FINA 361A; SCMA 331; SCMA 335; SCMA 350

ACTS 395 Professional Internship
Crosslisted with: BSAD 395, ACCT 395, ECON 395, FINA 395, MNGT 395, SCMA 395
Prerequisites: An undergraduate major in the College of Business with at least sophomore standing and departmental consent and acceptance into an approved internship. Departmental credit for course cross-listings may have additional requirements for consent.
Notes: May be repeated.
Description: Provides an opportunity to study theories, principles, practices, techniques, and strategies utilized in the business field through an internship related to the major field of study and an integral or important part of their program of study. Reflect on classroom knowledge and develop practical experience in professional business situations through an approved internship.
Credit Hours: 0-3
Min credits per semester:
Max credits per semester: 3
Max credits per degree: 6
Grading Option: Graded with Option
Experiential Learning: Internship/Co-op

ACTS 396 Independent Study
Prerequisites: Permission.
Description: Faculty supervised independent study.
Credit Hours: 1-3
Min credits per semester: 1
Max credits per semester: 3
Max credits per degree: 6
Grading Option: Graded with Option

ACTS 410 Credibility Theory and Loss Distributions
Crosslisted with: ACTS 810
Prerequisites: STAT 463 with a grade of "C" or better.
Description: Introduction to a variety of loss distributions used for prediction of losses in short-term insurance, different approaches to model selection, and Bayesian and empirical Bayesian credibility theory.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded
Offered: SPRING

ACTS 430 Actuarial Applications of Applied Statistics
Crosslisted with: ACTS 830
Prerequisites: STAT 463 with a grade of "C" or better
Notes: Data sets processed and analyzed using statistical software.
Description: Introduction to forecasting in actuarial science. Simple and multiple regression, instrumental variables, time series methods, and applications of methods in forecasting actuarial variables. Interest rates, inflation rates, and claim frequencies.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded

ACTS 431 Actuarial Applications of Time Series and Machine Learning
Crosslisted with: ACTS 831
Prerequisites: STAT 463 with a grade of "C" or better.
Description: Introduction to statistical learning with actuarial applications using time series models and machine learning techniques. The topics covered include time series models, principal component analysis (PCA), decision tree, and clustering.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded
Offered: SPRING

ACTS 440 Interest Theory
Crosslisted with: ACTS 840
Prerequisites: MATH 208 or 208H, or parallel
Notes: Grade only
Description: Fundamental concepts of financial mathematics, and how those concepts are applied in calculating present and accumulated values for various streams of cash flows. Practical applications of these concepts in loans, bonds, capital budgeting, and portfolio management.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded
Prerequisite for: AECN 416; ECON 365, FINA 365; FINA 338; FINA 363; FINA 367; FINA 375; FINA 382; FINA 405; FINA 450; FINA 461; FINA 464; MNGT 475; MNGT 475H, RAIK 476H

ACTS 445 Introduction to Actuarial Models
Prerequisites: MATH 208 or 208H with a grade of "Pass" or "C" or better.
Description: Basic probability theory, random variables for actuarial models, bask distributional quantiles, characteristics of actuarial models, commonly used discrete and continuous distributions for actuarial models, and survival models.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded
Offered: SPRING

ACTS 450 Stochastic Processes for Actuaries
Crosslisted with: ACTS 850
Prerequisites: STAT 463 with a grade of "C" or better
Description: Introduction to stochastic processes and their applications in actuarial science. Discrete-time and continuous-time processes; Markov chains; the Poisson process; compound Poisson processes; non-homogeneous Poisson processes; arithmetic and geometric Brownian motions. Applications of these processes in computation of resident fees for continuing care retirement communities. Pricing of financial instruments.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded

ACTS 460 Short-Term Actuarial Mathematics
Crosslisted with: ACTS 860
Prerequisites: ACTS 445 and STAT 462, each with a grade of "C" or better.
Description: Introduction to short-term insurance coverage, risk measure, coverage modifications, aggregate loss models, introduction to credibility, short-term insurance loss reserving, and short-term insurance ratemaking.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded
Offered: SPRING
Prerequisite for: ACTS 473, ACTS 873

ACTS 470 Long-Term Actuarial Mathematics
Crosslisted with: ACTS 870
Prerequisites: ACTS 445 and STAT 462, each with a grade of "C" or better
Notes: First course of a two-course sequence that includes ACTS 471.
Description: Theory and applications of contingency mathematics in the areas of life and health insurance, annuities, and pensions. Probabilistic models.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded
Offered: SPRING
Prerequisite for: ACTS 471, ACTS 871; ACTS 472, ACTS 872

ACTS 471 Advanced Long-Term Actuarial Mathematics I
Crosslisted with: ACTS 871
Prerequisites: ACTS 470 and STAT 462, each with a grade of "C" or better; graduate students must complete ACTS 870 with a grade of "B" or better.
Notes: Second course of a two-course sequence that includes ACTS 470.
Description: Further applications of actuarial probabilistic methods to determine net premiums, gross premiums, and reserves in the areas of life and health insurance, and annuities. Other topics include insurance and annuities involving multiple lives, multiple decrements, multi-state models, and pensions.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded
Offered: FALL

ACTS 472 Advanced Long-Term Actuarial Mathematics II
Crosslisted with: ACTS 872
Prerequisites: ACTS 470 and STAT 462, each with a grade of "C" or better; graduate students must complete ACTS 870 with a grade of "B" or better.
Description: Further applications of actuarial probabilistic methods to determine in the areas of interpreting and performing calculations involving profit testing on both traditional life insurance and more modern life insurance such as universal life and equity-linked insurance, as well as pricing and reserving embedded options.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded
Offered: FALL

ACTS 473 Introduction to Advanced Short-Term Risk Models
Crosslisted with: ACTS 873
Prerequisites: ACTS 460 and STAT 462, each with a grade of "C" or better; graduate students must completed ACTS 860 with a grade of "B" or better.
Description: The theory and applications of short-term actuarial models are explored. Topics include Interpreting and performing calculations involving: (i) some commonly used claim frequency and claim severity distributions as they are applied in so-called aggregate risk models; (ii) coverage modifications; (iii) actuarial ratemaking; and (iv) various loss-reserving techniques for property/casualty insurance policies.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded
Offered: FALL

ACTS 475 Actuarial Applications in Practice
Crosslisted with: ACTS 875
Prerequisites: ACTS 470/870; FINA 338
Description: Principles and practices of pricing and/or funding and valuation for life, health, property and liability insurance, and annuities and pension plans. Commercially available actuarial modeling software.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded
Offered: FALL/SPR
ACE: ACE 10 Integrated Product

Career Information

The following represents a sample of the internships, jobs and graduate school programs that current students and recent graduates have reported.

Transferable Skills

- Apply mathematical and scientific skills to solve real-world problems
- Develop basic techniques of statistical analysis
- Make predictions using mathematical, statistical, and scientific modeling methods
- Analyze and explain data
- Support and communicate claims using clear evidence
- Collaborate with a team to develop solutions
- Confidently navigate complex, ambiguous projects and environments
- Understand and operate within ethical framework for professional work in the field

- Use quantitative analysis techniques
- Use qualitative analysis techniques

Jobs of Recent Graduates

- Assistant Account Manager, FACTS – Lincoln, NE
- Project Manager, Mach 33 Engineering – Washington D.C.
- Actuarial Analyst, Endure Energy – Overland Park, KS
- Business Analyst II, Fiserv – Omaha, NE
- Technical Solutions Engineer, Epic – Verona, WS
- Corporate Auditor, Union Pacific Railroad – Omaha, NE
- Machine Learning Engineer, Enhance IT – Atlanta, GA
- Associate Actuarial Analyst, UnitedHealthcare – Lincoln, NE
- Data Analyst, Kiewit – Lone Tree, CO
- Underwriter, Omaha National – Omaha, NE

Graduate & Professional Schools

- Master's Degree, Applied Mathematics, University of Nebraska-Lincoln – Lincoln, NE
- Master's Degree, Business Analytics, Pepperdine University – Los Angeles, CA
- Master's Degree, Finance, Peking University – Beijing, China
- Master's Degree, Analytics, Northeastern University – Boston, MA
- Master's Degree, Statistics, Northern Arizona University – Flagstaff, AZ
- Doctoral Degree, Mathematics, Kansas State University – Manhattan, KS