ACTUARIAL SCIENCE (BUSINESS)

Description

An actuary is a mathematically-oriented business person who will most likely be a manager or supervisor at some point in his/her career. Thus, a course of study culminating in a bachelor of science degree in business administration with a major in actuarial science is an excellent educational background for prospective actuaries. Additional information is available at www.BeAnActuary.org (http://www.BeAnActuary.org).

The actuarial science program is designed to prepare students for the current industry demands. Because the demands change on a regular basis, oftentimes the number of hours, the sequencing of courses, and the specific requirements change for this major. Students should continue to consult with the department for the appropriate selection and listing of course requirements.

The actuarial science program is proud to have been named one of the first Centers of Actuarial Excellence by the Society of Actuaries.

All actuarial science students are encouraged to visit the actuarial science program's website (https://business.unl.edu/academic-programs/departments/finance/actuarial-science/) and an actuarial science program faculty advisor for more information about the program, including the Actuarial Science Club, sequencing of courses, scholarship opportunities, and the requirements for achieving professional actuarial designations.

In addition, because of the mathematical orientation for this program, actuarial science majors are required to make some modifications to the degree program requirements. These requirements (with a reminder that all required coursework must be taken for a grade) are noted below.

Other

Substitutions When Changing Majors

If actuarial science students change to a different major in the College of Business, the following substitutions may be made:

ACTS 440 Interest Theory for FINA 361 Finance

ACTS 445 Introduction to Actuarial Models for ECON 215 Statistics

COLLEGE REQUIREMENTS

College Admission

The entrance requirements for the College of Business (CoB) are the same as the University of Nebraska–Lincoln General Admission Requirements.

Honors Program

Nebraska Business Honors Academy

The Nebraska Business Honors Academy is a unique cohort-based program for high-ability students with demonstrated leadership potential. The goal of the Academy is to develop critical thinking, problem-solving, and communication skills to prepare graduates to be strategic decision-makers and innovators. The Academy combines a rigorous curriculum (including approximately 40 credit hours of cohort-based courses) with leadership training, co-curricular activities, and corporate involvement. Nebraska Business Honors Academy requirements differ from those listed in the catalog. Students work closely with the Academy's advisors on appropriate sequencing and enrollment in Academy-specific requirements.

Jeffrey S. Raikes School of Computer Science and Management

The purpose of the Jeffrey S. Raikes School of Computer Science and Management is to produce unique graduates who combine business knowledge and computing fundamentals for enterprise information and software systems. Graduates will be professionals who understand the multiple levels of new information systems and who become the technology sector's innovators, product developers, entrepreneurs, chief information officers, and CEOs. Students interested in learning more about the Jeffrey S. Raikes School of Computer Science and Management program and curriculum requirements (which may differ from those listed here) are encouraged to call 402-472-6000 or visit the Jeffrey S. Raikes program website (https://raikes.unl.edu/). Students may also reference the Jeffrey S. Raikes School of Computer Science and Management catalog section under Other Academic Units.

College Degree Requirements

Overview of College Degree Requirements

The curriculum requirements for the College consist of coursework in four areas. All coursework (except electives and where otherwise noted) must be taken for a grade.

1. Non-Business Requirements

- Consist primarily of College and University ACE (Achievement-Centered Education) coursework

2. Business Core

- Purposeful Strategist (includes ACE 6, 8, 10)
- Data Driven Decision Maker
- Effective Communicator (includes ACE 1 and 2)
- Empowered Professional

3. Business Major

4. Electives

Non-Business Requirements

(remaining ACE requirements not included in the Business Core and Business Major requirements)

Five Courses (normally 15-17 hours)

All students in the College of Business will take the following non-business courses (unless otherwise noted).

- The college requires a calculus course from the below options to complete the ACE 3 requirement.
- Most students will take coursework to fulfill these requirements during the freshman/sophomore year. However, if hours are still needed during the junior/senior year, there may also be options to 'double count' coursework for ACE 4 and/or ACE 9 toward the major or a minor. This is likely to be of most benefit to 'transfer-in students' due to the nature of the program and when ACE requirements are traditionally taken.

All ACE coursework must be taken for a grade.

ACE 3: Mathematical, Computational, Statistical or Formal Reasoning Skills

Choose ONE of the following:

MATH 104 Applied Calculus

MATH 106 Calculus I

Any advanced calculus course above the 106 level

Notes regarding the selection of coursework for ACE 3:

- **Credit cannot be given for both** MATH 104 **and** MATH 106 **.** Students must determine the appropriate course early in their program.
- A first-semester student's score on the Math Placement Exam will determine eligibility for MATH 104 or MATH 106. The student should select between these classes based on the following sets of circumstances:
  - Actuarial science majors **MUST** take MATH 106 (or a higher-level calculus). They will later take MATH 107 Calculus II and MATH 208 Calculus III.
  - Raikes students MUST take MATH 106 and MATH 107 (or a higher-level calculus).
  - MATH 106 (or higher calculus) is **strongly encouraged** for those students majoring in accounting, majoring in finance, majoring in economics, or considering graduate school.

Math Placement Exam (MPE)
Students admitted to the College of Business are required to take a Math Placement Exam prior to enrolling in the college math requirement of MATH 104 or MATH 106 (or higher math). The results will determine where a student starts.

- Preparatory courses should be taken as soon as possible to avoid future sequencing problems.
- Additional information about the exam can be found on the Math Placement website (http://www.math.unl.edu/resources/undergraduate/mpe/).

Whether required to enroll in preparation coursework first, as indicated on the MPE (MATH 100A Intermediate Algebra, MATH 101 College Algebra and/or MATH 103 College Algebra and Trigonometry), or in one of the required courses, it is critical to begin math the first semester on campus.

ACE 4: The Study of Scientific Methods and Knowledge of the Natural and Physical World

Choose one course from ACE 4 Certified Courses. (Course credit will vary between 3-5 credit hours.)

ACE 5: Study of Humanities

Choose one course from ACE 5 Certified Courses.

ACE 7: Study of the Arts to Understand Their Context

Choose one course from ACE 7 Certified Courses.

ACE 9: Global Awareness or Knowledge of Human Diversity Through Analysis of an Issue

Choose one course from ACE 9 Certified Courses.

In any of the above instances where double counting is an option, only 3 hours of credit are awarded; students will still need to meet the 120 hours for graduation.

Business Core – Four Sections (approximately 53 hours for most majors)

- Purposeful Strategist – 33 hours
- Data Driven Decision Maker – 7 hours (17 hours for Actuarial Science)
- Effective Communicator – 9 hours (7 hours for Actuarial Science)
- Empowered Professional – 3-4 hours

The Business Core is designed to expose students to the various business disciplines. The Business Major courses are those courses identified for each of the individual majors. All coursework for the Business Core (except where noted differently) must be taken for a grade. All students in the College of Business will take the Business Core (unless otherwise noted).

Purposeful Strategist - 33 hours

- MNGT 101 Introduction to Business
- ACCT 201 Introductory Financial Accounting
- ACCT 202 Introductory Managerial Accounting
- ECON 211 Principles of Macroeconomics (ACE 6)
- ECON 212 Principles of Microeconomics (ACE 6)
- BLAW 371 Legal Environment (ACE 8)
- FINA 361 Finance
  - Actuarial Science majors take FINA 461.
- MNGT 301 Introduction to Management
- MRKT 341 Marketing
- SCMA 331 Operations and Supply Chain Management
- MNGT 475 Business Strategies (ACE 10)
  - A capstone course integrating business concepts covered throughout the program.
  - Actuarial science majors may take FINA 461 concurrently with MNGT 475.
  - Must be taken at the University of Nebraska-Lincoln and taken for a grade.

Data Driven Decision Maker

- BSAD 50 Business Computer Applications
  - Required basic-skills computer course that uses Microsoft Access, Word, PowerPoint, and Excel.
- SCMA 250 Spreadsheet Analytics
  - Actuarial science majors take ACTS 250 Actuarial Technical Skills.
- ECON 215 Statistics (ACE 3)
  - Must take ECON 215 (not STAT 218 Introduction to Statistics nor EDPS 459 Statistical Methods nor CRIM 300 Applied Statistics and Data Processing in the Public Sector nor SOCI 206 Introduction to Social Statistics).
  - Actuarial science majors **MUST** take ACTS 445 Introduction to Actuarial Models instead of ECON 215; (actuarial science majors will also take STAT 462 Introduction to Mathematical Statistics I: Distribution Theory and STAT 463 Introduction to Mathematical Statistics II: Statistical Inference).
  - Economics majors or minors can take STAT 380 instead of ECON 215.

- SCMA 350 Business Analytics/Information Analysis
  - Marketing and agribusiness majors may choose to take MRKT 350.
  - Actuarial science majors will take SCMA 451 Introduction to Predictive Analytics.

Effective Communicator

- BSAD 220 Business Writing (ACE 1)
- MRKT 257 Sales Communication (ACE 2)
  - Or, COMM 286 Business and Professional Communication (ACE 2)
- BSAD 261 Applied Improv for the Successful Business Leader
- BSAD 340 Navigating Emerging Technologies in Business
  - ACTS 475 meets the knowledge requirement for BSAD 340 for Actuarial Science majors; BSAD 340 is waived for Actuarial Science majors.

Empowered Professional (PrEP) (3-4 hours)

Designed to develop confident and professional business students positioned for lifelong career success, the Professional Enhancement Program (PrEP) consists of four required 1-hour courses.

- BSAD 111 PrEP I, Investing in Strengths or BSAD 111S PrEP I, Investing in Strengths for Transfer Students
- BSAD 222 PrEP II, Career Development and Planning
- BSAD 333 PrEP III, Internship and Job Search Strategies
- BSAD 444 PrEP IV, Professional and Life Skills
  - Taken the semester of graduation.

Business Major – (21-31 hours)

- Coursework for the major requires completion of specific, required courses of the department (see individual major page), along with other guidelines.
- Business majors and minors cannot double count with Business Core (for example, MNGT 301 and MNGT 475 do not count towards the management majors).
- Business students cannot earn a major and a minor in the same area (for example, an Economics major cannot get an Economics minor; an International Business major cannot earn a Global Leadership minor). Similarly, International Business majors cannot earn a major or minor in the same option or subplan as their International Business major. (For example, an International Business-Finance major cannot earn a major or minor in Finance but could earn a major or minor in any other business area.)
- Business Administration majors cannot double count courses with any College of Business major or minor.
- Careful and advanced planning is necessary, as some courses for the major may not necessarily be available every semester, and classes for the major are limited in the summer sessions.
- ALL coursework for the major must be taken for a grade (students may not take classes Pass/No Pass).
- Sequencing of classes is critical; plan the major courses well in advance of enrollment. Visit with an academic advisor for assistance in planning critical class sequencing.
- A maximum of 3 hours of coursework may transfer if the 18-hour limitation has not been exceeded. Further restrictions may apply.

Electives – Hours vary to meet 120 hour minimum to graduate

Electives round out the rest of the 120 hour curriculum. Students have the option to choose courses toward a second major, a dual degree, a minor (or two); or students can simply select courses of personal interest.

- Some hours may need to be additional business coursework (to meet the requirement that 60 hours of coursework be in business). This requirement will vary by major.
- In a 21-hour Business Major, students will average 28 hours of elective credit; second major options and/or minors may be appropriate to consider for elective hours.

Other Requirements

Business Course/Business Elective Hours

At a minimum, 60 hours of business courses are required for the BSBA degree.

The required hours WILL VARY BY MAJOR, dependent on how requirements have been accepted and/or completed throughout the previous components of the program. While **GENERAL MINIMUM** guidelines by major are noted below, the Degree Audit will specify *minimum business* credit hour expectations for each student. Students will generally see this addressed under the ELECTIVE section (BUSINESS ELECTIVES) on the Degree Audit.

- Economics, marketing, and management (Entrepreneurship, General, and Leadership options) majors – 3 hours of business electives.
- Accounting, business administration, and management (Human Resources and Clifton Builders options) majors – no additional business coursework, as the major consists of 24 hours of business coursework.
- Actuarial science majors – no additional business coursework, as the major consists of more than 24 hours of business coursework.
- Finance majors – no additional business coursework, as the major consists of 24-27 hours of business coursework.
- Supply chain management and business analytics majors – no additional business coursework, as the major consists of 27 hours of business coursework.
- Agribusiness, Business & Law, and Raikes majors – no additional business coursework required due to intent of major as being 'business-related' coursework.
- Additional hours may be required if there is a variation in hours for Non-Business Requirement, Business Core, Business Major, or if there is a violation of transfer limits, etc.

Experiential Learning Requirement

All undergraduates in the College of Business must complete an Experiential Learning designated course or experience (which may include 0-credit courses designated to document co-curricular activities recognized as experiential learning).

Grade Rules

C- and D Grades

While students may earn grades of C- or D, there are restrictions and recommendations for such grades and further enrollment options:

- A grade of C or higher is expected in prerequisite courses to enroll in ACCT courses.
- A grade of C or higher is required in FINA 361 in order to take most upper-level FINA courses.
- A grade of C or higher is required in other departmental higher-level sequencing courses (i.e., MATH 101 to take MATH 104, etc.). See course descriptions to determine enrollment restrictions.
- Grades of C- or lower may be replaced in the calculation of GPA by retaking the course at the University of Nebraska–Lincoln or within the University system (UNK, UNO).
- Grades of C or better are required to transfer courses from outside of the University of Nebraska system.
- Academic bankruptcy options may be considered for students who have one or two semesters of poor performance.

Pass/No Pass

Several restrictions apply when considering the Pass/No Pass option:

- BSAD 111, BSAD 222, BSAD 333, BSAD 444, and BSAD 50 are offered only as Pass/No Pass. All are required.
- Students may apply no more than 6 hours of elective credit using the Pass/No Pass option (excludes ACCT 395A, BSAD 111, BSAD 222, BSAD 333, BSAD 444, BSAD 395 (and cross-listings), MRKT 395).
- **No** student enrolled in **any** college at the University of Nebraska–Lincoln may take business courses in the College of Business using the Pass/No Pass option.
- College of Business students may **NOT** take coursework to satisfy ACE requirements, nor any required business coursework, including in the major and minor, using the Pass/No Pass option.
- Students majoring in actuarial science through the College of Business may **NOT** take any math, actuarial science, or required courses using the Pass/No Pass option.
- Students taking courses to fulfill the requirements of a minor in an area of study outside the College of Business are subject to College rules restricting use of the Pass/No Pass option if courses in the minor are used to meet ACE or any college-specific requirements.
- Students seeking any minor outside the College should verify rules applying to minimum grade expectations and Pass/No Pass options with the advisor for their minor, as additional restrictions may apply and often vary.
- Students from UNO/UNK/UNMC and from other institutions are subject to the same restrictions listed here for University of Nebraska–Lincoln students.

Exceptions to the above rules are limited to the following and no other exceptions will be made.

- An independent study or an internship course (391, 395, 396) may be taken in the College of Business using the Pass/No Pass option with the permission of the instructor and the department chair, but College of Business students who qualify for this exception may use the independent study or an internship course (391, 395, 396) **only** as elective credit.
- ACCT 395A, BSAD 395 (and cross-listings) and MRKT 395 taken in the Pass/No Pass format will not count against the six hour Pass/No Pass maximum in open electives.
- Advanced Placement grades of Pass and Credit By Exam grades of Pass will be accepted to fulfill degree requirements. These hours will not count against the 6-hour-maximum hours permitted.
- Students who travel abroad and return with "credit" rather than grades from the institution where they studied may use Pass grades to fulfill degree requirements. These hours will not count against the 6-hour maximum number of hours permitted.

Transfer Credit Rules

For detailed information on transfer credit rules, see Transfer Credit Restrictions (https://catalog.unl.edu/undergraduate/business/) under Course Exclusions and Restrictions (https://catalog.unl.edu/undergraduate/business/).

Residency

At least 30 of the last 36 hours of credit must be registered for and completed in residence at the University of Nebraska–Lincoln.

Students electing to study abroad during part of this time are exempted for the hours earned abroad, but no additional hours may be transferred in the last 36 hours. This exemption requires filing a written appeal in the Business Advising and Student Engagement Office (Hawks Hall 125).

ACE Requirements

All students must fulfill the Achievement-Centered Education (ACE) requirements. Information about the ACE program may be viewed at the Achievement-Centered Education website (https://ace.unl.edu/). MyRED may also be used to search for currently offered ACE classes.

ACE Achievement-Centered Education—Ten Courses (normally 30 hours)

This is the university's innovative, outcomes-focused general education component designed to enhance the undergraduate experience by providing broad exposure to multiple disciplines, complementing the major, and helping students develop important reasoning, inquiry, and civic capacities.

Important rules to remember when selecting coursework to meet this requirement:

- There are 10 ACE Student Learning Outcomes (SLOs). At least one course, equivalent to 3 credit hours, must be taken for each of the 10 SLOs.
- Up to three ACE SLOs from ACE 4–10 may be satisfied by work in one subject area.
- ACE SLOs must be satisfied by work in at least three subject areas.
- No ACE course may satisfy more than one ACE SLO in a student's program.
- If an ACE course addresses two ACE SLOs, the student decides which one of the two outcomes the course will satisfy in that student's program. (The Degree Audit will make an automatic decision based on first course taken, first SLO needed.)
- As part of the College requirements of non-business and business courses, many courses will also work for ACE. Students should carefully review required coursework with ACE options to make the best use of courses to fulfill both degree requirements as well as University of Nebraska–Lincoln ACE requirements.

Catalog Rule

Students (including transfer students) must follow the Undergraduate Catalog in effect when they are admitted into the College of Business. Students who leave the College and return, or those applying for 'readmission' to the College, are subject to requirements in place at the time of their readmission to the College.

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. The College will determine eligibility 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 timeframe allowable for that catalog year.

Learning Outcomes

Graduates of actuarial science will be able to:

1. Demonstrate the ability to apply the concepts 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:
   - Current or developing areas of actuarial practice
   - Research designed to deepen or broaden actuarial knowledge
   - Education of aspiring or practicing actuaries

Major Requirements

Core Requirements

In addition to the College Degree Requirements, students will complete 30 hours of coursework for the major.

Actuarial science majors must take MATH 106 Calculus I, MATH 107 Calculus II, and MATH 208 Calculus III. These hours have been built into the College Degree Requirements as part of the Non-Business Requirements.

ACTS 395 Professional Internship and ACTS 396 Independent Study may not count toward the major or minor in actuarial science.

Other College Degree Requirement (Business Core) changes for actuarial science majors include:

- ACTS majors must take ACTS 445 Introduction to Actuarial Models in place of ECON 215 Statistics for the Major requirements.
- ACTS majors must take ACTS 250 Actuarial Technical Skills in place of SCMA 250 Spreadsheet Analytics for the Major.
- ACTS majors will take SCMA 451 Introduction to Predictive Analytics in place of SCMA 350 Business Analytics/Information Analysis for the Major requirements.
- ACTS majors will also take STAT 462 Introduction to Mathematical Statistics I: Distribution Theory and STAT 463 Introduction to Mathematical Statistics II: Statistical Inference for the Major requirements.
- ACTS majors will take FINA 461 Advanced Finance in place of FINA 361 Finance for the Major requirements; the prerequisite of FINA 361 (for FINA 363 Investment Principles and FINA 461) is satisfied with completion of ACTS 440 Interest Theory.

Business Major

Requirements for students interested in pursuing the bachelor of science degree with a major in actuarial science will complete 30 hours of actuarial science coursework for the Business Major:

Requirements		
ACTS 440	Interest Theory	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
FINA 363	Investment Principles	3
or FINA 367	Fixed Income Investments	
Select four of the following:		12
ACTS 410	Credibility Theory and Loss Distributions	
ACTS 430	Actuarial Applications of Applied Statistics	
ACTS 431	Actuarial Applications of Time Series and Machine Learning	
ACTS 450	Stochastic Processes for Actuaries	
ACTS 471	Advanced Long-Term Actuarial Mathematics I	
ACTS 472	Advanced Long-Term Actuarial Mathematics II	
ACTS 473	Introduction to Advanced Short-Term Risk Models	
FINA 412	Life and Health Insurance	
FINA 438	Enterprise Risk Management	

Credit Hours Subtotal:	30
Total Credit Hours	**30**

Additional Major Requirements

Grade Rules

C- and D Grades

A grade of D- or above is required for all courses in the major. Grades of C or better are required in transfer courses from outside of the University of Nebraska system.

Pass/No Pass

As noted in the College Degree Requirements section, all coursework for the major must be taken for a grade

Requirements for Minor Offered by Department

Actuarial Science Minor

The actuarial science minor is available to College of Business students only. No more than one course/requirement may be transferred into the minor. Coursework used for this minor cannot double count with the Business Core or the Business Administration major.

To fulfill the requirements for an actuarial science minor, students must complete 12 graded hours of actuarial science coursework; suggested courses are:

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
Total Credit Hours		**12**

NOTE: ACTS 395 Professional Internship and ACTS 396 Independent Study may not be used toward the minor (or major).

Grade Rules

C- and D Grades

A grade of D- or above is required for all courses in the minor. Grades of C or better are required in transfer courses from outside of the University of Nebraska system. Course prerequisites still apply.

Pass/No Pass

No course may be taken pass/no pass.

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

- Analytical Skills
- Problem-Solving/Critical Thinking Skills
- Quantitative Skills
- Computer Skills
- Oral and Written Communication Skills
- Organizational Skills
- Detail-Oriented
- Ability to Work Independently
- Teamwork

Jobs of Recent Graduates

- Actuarial Analyst, Milliman - Omaha, NE
- Actuarial Analyst, Aetna - Omaha, NE
- Property and Casualty Actuarial Analyst, Allstate Insurance - Chicago, IL
- Senior Actuarial Analyst, Cigna - Denver, CO
- Sales and Trading Analyst, Citigroup - New York City, NY
- Human Capital Analyst, Deloitte - Minneapolis, MN
- Associate Actuarial Analyst, UnitedHealth Care - Minnetonka, MN
- Actuarial Analyst, Wakely Consulting Group - Denver, CO
- Operational Risk Associate, Wells Fargo - Des Moines, IA
- Actuarial Analyst, Retirement Consulting, Aon Hewitt - Lincolnshire, IL

Internships

- Actuarial Intern, Allstate Insurance - Northbrook, IL
- Actuarial Intern, Ameritas - Lincoln, NE
- Actuarial Intern, CSG Actuarial - Omaha, NE
- Acuarial Intern, Hannover - Denver, CO
- Actuarial Intern, Lincoln Financial Group - Omaha, NE
- Actuary Intern, Markel - Omaha, NE
- Actuarial Intern, Mutual of Omaha - Omaha, NE
- Compliance Intern, State Farm Insurance - Bloomington, IL
- Property and Casualty Actuarial Intern, Hartford Insurance Company - Hartford, CT
- Actuarial Intern, Willis Towers Watson - St. Louis, MO