

# Minnesota State University Moorhead

## MATH 421: Actuarial Science I

### A. COURSE DESCRIPTION

Credits: 3

Lecture Hours/Week: 3

Lab Hours/Week: \*.\*

OJT Hours/Week: \*.\*

Prerequisites:

MATH 323 - Multi-Variable and Vector Calculus AND MATH 435 - Mathematical Statistics I

Corequisites: None

MnTC Goals: None

Applications and synthesis of mathematical and statistical concepts included in the Actuarial Examination I, administered by the Society of Actuaries. Linear time series models, seasonal models, stationary models, moving average, autoregressive and ARIMA models, model identification, confidence intervals and testing, forecasting and error analysis.

**B. COURSE EFFECTIVE DATES:** 01/24/2006 - Present

### C. OUTLINE OF MAJOR CONTENT AREAS

1. Review of mathematical and statistical concepts of distributions discussed in Math 435.
2. Solving problems involving univariate and multivariate probability distributions, joint, marginal, and conditional distributions, expectation and conditional expectation, transformations
3. Risk management concepts
4. Linear time series models
5. Autocorrelation and partial autocorrelation functions
6. Autoregressive models and movingaverage models
7. Seasonal and nonseasonal models
8. Seasonal and nonseasonal multiplicative models, understanding of the structure and the interpretation of such models
9. ARIMA models
10. Error Analysis and testing fitted models
11. Forecasting

### D. LEARNING OUTCOMES (General)

1. Solve a variety of problems involving the concepts included in the Actuarial Examination I.
2. Work with time series data and learn how to model such data
3. Learn how to interpret time series models and how to use them for forecasting.

### E. Minnesota Transfer Curriculum Goal Area(s) and Competencies

None

### F. LEARNER OUTCOMES ASSESSMENT

As noted on course syllabus

**G. SPECIAL INFORMATION**

None noted