**Actsc 613 Statistics for Actuarial Science**

**Syllabus**

- Discrete and continuous random variables; distribution and probability functions; expected values and higher moments.

- Binomial, negative binomial, geometric, hypergeometric, Poisson discrete distributions; Normal, lognormal, exponential, gamma, $t$, $F$, beta, uniform and Pareto continuous distributions.

- Probability, moment and cumulant generating functions; derivations and applications.

- Dependence; joint distributions, conditional distributions.

- The central limit theorem.

- Random sampling and sampling distributions.

- Estimation and estimators; method of moments, maximum likelihood estimation, properties of estimators.

- Confidence intervals for unknown parameters.

- Hypothesis tests.

- Regression and linear models

**Note**: This course covers almost all of CT3, with the exceptions of Poisson processes, which are covered in Actsc 624, compound distributions, which are covered in Actsc 625 and regression, which is covered in Actsc 623. This course covers the material of SOA course P.

**Textbook**: There are many textbooks covering this material at an appropriate level. Examples would include Hogg McKeans and Craig, *Introduction to Mathematical Statistics*. This would be above the level of an MBA quantitative methods course, but below specialist statistics Masters courses.

**Contact Hours**: 36 lectures, 10 tutorials.

**Assessment**: 65% final exam (unseen); 15% midterm exam (unseen); 20% assignments.