

Department of Mathematics, Statistics, and Computer Science

Marquette University

## Syllabus

**Course:** MSCS 6010 Probability, Fall 2014

**Time:** TuTh 5:00-6:15 Cudahy Hall 126

**Instructor:** Daniel B. Rowe, Ph.D.

**Office Hours:** TuTh 4:00 pm – 5:00 pm

**Office:** CU 313

**E-mail:** [daniel.rowe@marquette.edu](mailto:daniel.rowe@marquette.edu)

**Texts:** (reference) Casella, G. & Berger, R.L. (2002). *Statistical Inference*, Second edition, Duxbury. ISBN: 0-534-24312-6

**Grading:** A midterm (in class) on Oct 23, weekly homework, and a final exam (in class) on Dec 9, 5:45 pm – 7:45 pm. Homework & Class Participation (30%), Mid-Term Exam (30%), and a Final (40%).

### Matlab Introduction

-Arithmetic and Variables, Arrays and Indexing, Programming, Plotting, Functions and m-files, Importing and Exporting Images

### Math Review

-differentiation, integration

### Events & Probability of events, Conditional Probability

### Combinations and Permutations

### Discrete Distributions

-properties, moments, expectation, transformation of variable, MGF

-Bernoulli, binomial, Poisson, hypergeometric

### Continuous Distributions

-properties, expectation, moments, transformation of variable, MGF

- uniform, beta, normal, chi square, gamma, exponential, student t, F

### Estimation & Hypothesis Testing

- random samples, likelihood, MLE, LRT

### Regression

- simple linear, multiple linear

### Multivariate Distributions

-normal, student t, Wishart, inverse Wishart

### Bayesian Statistics

-prior, likelihood, posterior, posterior estimation