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Department of Mathematics, Statistics, and Computer Science

Marquette University

Syllabus

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Course: MSCS 6010 Probability, Fall 2018

Time: TuTh 5:00-6:15 Cudahy Hall 143

Instructor: Daniel B. Rowe, Ph.D.

Office Hours: TuTh 4:00 pm – 5:00 pm

Office: CU 313

E-mail: daniel.rowe@marquette.edu

Texts: (reference) Casella, G. & Berger, R.L. (2002). *Statistical Inference*, Second edition, Duxbury. ISBN: 0-534-24312-6. Used as a reference and not directly covered.

Grading: A midterm (in class and possibly with a take-home part) on Oct 25, weekly homework, and a final exam (in class) on Dec 11, 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