

Lakehead University

Department of Mathematical Sciences

MATH-5333-WA

**Advanced Topics in Probability (Stochastic Processes)
Winter 2013**

COURSE OUTLINE

Instructor: Dr. Deli Li

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Objectives:

This course will serve as an introductory course to stochastic processes. We will follow the book “**Probability and Stochastic Processes with Applications**” by Oliver Knill.. Stochastic processes are collections of interdependent random variables. Many applications of stochastic processes occur in physics, engineering, biology, medicine, psychology, and other disciplines, as well as in other branches of mathematical analysis. Topics include probability spaces, random variables, conditional probability and conditional expectation, normal processes and covariance stationary processes, counting processes and Poisson processes, renewal counting processes, finite Markov chains, countable Markov chains, continuous-time Markov chains, etc.

Prerequisite:

Students should be comfortable with probability and statistics at the level of MATH-3332 and MATH-3334.

Textbook:

Probability and Stochastic Processes with Applications by **Oliver Knill**

Lectures:

Monday & Wednesday 02:30 PM – 04:00 PM in RC-1002.

Pre-reading related sections in the textbook is expected.

Office Hours:

Tuesday & Thursday 02:30 PM - 04:30 PM or by appointment.

For an appointment, please email the instructor.

Course Requirements:

Assignments: A list of assignment problems will be given to students during the Wednesday class period and are **due on the Friday in the following week. Late assignments will not be marked under any circumstances. Sloppy writing may face a mark penalty up to 20%. There will be approximately 6 assignments worth 20% of your final mark.**

Midterm Exam: The midterm exam will be written during the regularly scheduled class time (02:30 PM – 04:00 PM in in RB-3023) on **Thursday 14 February 2013. No make-up test is provided for any student who misses writing the midterm exam at the scheduled time.** If there is a legitimate (documented) excuse, the final mark will be calculated on the basis of the final exam. Otherwise, a grade of **0%** for the missed exam will be averaged with other grades.

Final Exam: The final exam will be written in the scheduled three hours. Further details will be provided closer to the exam dates.

All examinations will be open book and a calculator is allowed.

Determination of Final Marks: The basic formula is as follows

| | |
|-------------------------------------|------------|
| Assignments: | 20% |
| Presentation and Attendance: | 10% |
| Midterm Exams: | 20% |
| Final Exam: | 50% |

Drop Date: The final date to withdraw from this course without academic penalty is Friday 08 March 2013.

Academic Dishonesty: All cases of academic dishonesty will be dealt with according to the University's Code of Student Behaviour and Disciplinary Procedures, copies of which are available from the Registrar.