

# OR / STAT 645: Stochastic Processes

## Course Overview, Fall 2013

Many real-world processes are fundamentally *stochastic* – that is, they have some degree of randomness or uncertainty. This course provides an in-depth survey of models that can be used to analyze a wide variety of stochastic processes. The focus includes quantitative and theoretical analysis of such models as well as practical issues using such models to represent real problems. This course assumes some prior knowledge of probability and basic stochastic models (like Markov chains). The pre-requisite is OR 542 (Stochastic Models), or STAT 544 (Applied Probability), or permission of the instructor.

Class Hours: Tuesday, 4:30 – 7:10 pm, Robinson Hall A, room 105  
 Pre-requisites: OR 542, or STAT 544, or permission of instructor

Instructor: John Shortle  
 jshortle@gmu.edu  
 703-993-3571  
 Nguyen Engineering Building, room 2210  
 Office hours: Tue 3:30 – 4:30 pm, Wed 2 – 3 pm.

Textbook: S. Ross, *Introduction to Probability Models* (10<sup>th</sup> edition; earlier editions may be fine too)

### Student Evaluation Criteria

|            |     |
|------------|-----|
| Homework   | 10% |
| Midterm    | 40% |
| Final exam | 50% |

### Syllabus and Course Schedule

Last updated: 8/5/13

| Class   | Lecture Topic   | Homework    |
|---------|---|-------------|
| Aug. 27 | Review of probability<br>The exponential distribution |             |
| Sep. 3  | The Poisson process                                   | Hmwk #1 due |
| Sep. 10 | The Poisson process                                   |             |
| Sep. 17 | Markov chains   | Hmwk #2 due |
| Sep. 24 | Markov chains   |             |
| Oct. 1  | Markov chains   | Hmwk #3 due |
| Oct. 8  | ** Midterm **   |             |
| Oct. 15 | ** Columbus Day **                                    |             |
| Oct. 22 | Markov chains   | Hmwk #4 due |
| Oct. 29 | Renewal theory  |             |
| Nov. 5  | Renewal theory  | Hmwk #5 due |
| Nov. 12 | Renewal theory  |             |
| Nov. 19 | Brownian motion                                       | Hmwk #6 due |
| Nov. 26 | Brownian motion                                       |             |
| Dec. 3  | Brownian motion                                       | Hmwk #7 due |
| Dec. 10 | ** Final Exam **, 4:30 pm – 7:15 pm                   |             |