STT 882: Theory of Probability, II  
Spring Semester, 2011

Time and Place: M-W-F 1:50–2:40PM  A506 Wells Hall
Instructor: Yimin Xiao, A-437 Wells Hall
Phone Number and E-Mail: 432-5411 xiao@stt.msu.edu
Office Hours: M W F 3:00–4:00PM, or by appointment.


Prerequisite: Good standing in STT881 and MTH 828 Real Analysis.

This course is the second part of the series STT 881–882. The content of STT 881–882 includes measure and integration theory (review in nature), limit theorems for independent random variables and theory of stochastic processes. The objective of STT 881–882 is to lay a rigorous foundation on probability theory for graduate students studying probability, statistics, analysis and related areas.

STT 882 is on theory of stochastic processes which covers Random walks, Martingales, Markov chains and Brownian motion. Some applications of probabilistic techniques in other areas will be mentioned. The following is a tentative schedule of the lectures:

- Weeks 1–2: Random walks, transience and recurrence, renewal theory.
- Weeks 3–5: Martingales, martingale convergence theorem, Doob’s inequality, optional stopping theorem, and applications of martingales.
- Weeks 6–8: Markov chains, their stationary measures and asymptotic behavior.
- Week 10: Ergodic theorem.
- Weeks 11–16: Brownian motion, strong Markov property, reflection principle, Donsker’s theorem, modulus of continuity, Khinchine’s law of the iterated logarithm.

The final grade is determined from homework problems, a mid-term and the final exam. The dates for the exams will be given later.

The relative weighting is: Midterm exam, 40%; Final Exam, 40%; Homework, 20%.

The grades will be given roughly according to the following scheme:
### Important Dates:

- **January 10**  
  First day of classes

- **January 17**  
  Martin Luther King Day (No classes)

- **February 3**  
  End of 100% tuition refund

- **March 2**  
  Middle of the semester, last day to drop with no grade

- **March 7–11**  
  Spring Break

- **April 29**  
  Last day of classes

- **May 3–7**  
  Final exam week

**ADA Statement**  
The Americans with Disabilities Act requires that reasonable accommodations be provided for students with physical, sensory, cognitive, systemic, learning, and psychiatric disabilities. Please contact me at the **beginning** of the quarter to discuss any such accommodations for the course.