Markov Chains in Statistics
Fall 2016

Days: Wednesdays
Meeting Time: 12:45-3:15pm
Classroom: Monroe Hall 110

Instructor: Winfried Barta
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Required Textbook:
L. Levin, Y. Peres, E. Wilmer (2009). 
*Markov Chains and Mixing Times*. AMS, Providence RI.
Electronic version freely available at http://pages.uoregon.edu/dlevin/MARKOV/

Supplementary Textbooks:


Available freely online while on campus via http://findit.library.gwu.edu/go?sid=sfx:e_collection&isbn=9781441915764&pid=serviceType=getFullTxt
Course Description:
This course is an introduction to the theory of Markov chains and their applications in Statistics via Markov chain Monte Carlo methods.

Some topics: Recurrence and Transience, Irreducibility, Stationary Distributions, Ergodicity, Limit Theorems, Convergence Rates and Mixing Times, Coupling, Gibbs Sampler, Metropolis Algorithm, Performance Analysis of Markov chain Monte Carlo Methods.

Learning outcomes
As a result of completing this course, students will be able to:

1. Understand the basic theory of Markov chains.
2. Identify situations in science, engineering, and statistics that are amenable to analysis by Markov chain Monte Carlo methods.
3. Perform a probabilistic analysis of those methods, and interpret the results in terms of the relevant applications.

Prerequisites:
Stat 6201.

Grading Policy
Midterm (30%)
Homework (35%)
Final (35%)
Class participation (0-5%)

Note that these add up to 100-105%.

Class Policies
Late work: Will not be accepted. If you turn in your homework or final project (if applicable) late, you get zero points.
Make-up exams: Except for emergencies with proper documentation, there will be absolutely no make-ups; you missed an exam, you failed it.

Blackboard
Please check Blackboard frequently, as there may be assignments, announcements, and material passed to the class via this electronic medium during the week. You can find it at http://blackboard.gwu.edu/
You need to login, using your NetID and password. You should also check your Email regularly, as some announcements regarding the class might be sent via Email.

**University Policy on Religious Holidays:**
1. Students should notify faculty during the first week of the semester of their intention to be absent from class on their day(s) of religious observance;
2. Faculty should extend to these students the courtesy of absence without penalty on such occasions, including permission to make up examinations;
3. Faculty who intend to observe a religious holiday should arrange at the beginning of the semester to reschedule missed classes or to make other provisions for their course-related activities

**ACADEMIC INTEGRITY**
I personally support the GW Code of Academic Integrity. It states: “Academic dishonesty is defined as cheating of any kind, including misrepresenting one's own work, taking credit for the work of others without crediting them and without appropriate authorization, and the fabrication of information.” For the remainder of the code, see: [http://www.gwu.edu/~ntegrity/code.html](http://www.gwu.edu/~ntegrity/code.html)

**SUPPORT FOR STUDENTS OUTSIDE THE CLASSROOM**

**DISABILITY SUPPORT SERVICES (DSS)**
Any student who may need an accommodation based on the potential impact of a disability should contact the Disability Support Services office at 202-994-8250 in the Marvin Center, Suite 242, to establish eligibility and to coordinate reasonable accommodations. For additional information please refer to: [http://gwired.gwu.edu/dss/](http://gwired.gwu.edu/dss/)

**UNIVERSITY COUNSELING CENTER (UCC) 202-994-5300**
The University Counseling Center (UCC) offers 24/7 assistance and referral to address students' personal, social, career, and study skills problems. Services for students include:
- crisis and emergency mental health consultations
- confidential assessment, counseling services (individual and small group), and referrals
  [http://gwired.gwu.edu/counsel/CounselingServices/AcademicSupportServices](http://gwired.gwu.edu/counsel/CounselingServices/AcademicSupportServices)

**SECURITY**
In the case of an emergency, if at all possible, the class should shelter in place. If the building that the class is in is affected, follow the evacuation procedures for the building. After evacuation, seek shelter at a predetermined rendezvous location.