



Marshall University Syllabus
College of Science
Department of Mathematics

Course: STA 660 – Stochastic Processes

Section: 102 [Hybrid]

CRN: 4808

Course Description: The course starts with a review of probability theory, random variables and conditioning. We focus mainly on the Discrete-Time Markov Process and Markov Chains, Poisson Process, Continuous-Time Markov Chains, Markovian Queuing Systems, and Random Walk. And depending on the availability of time, we may discuss any or all of Renewal Processes, Brownian motion and Markov Chain Monte Carlo (MCMC).

Prerequisites: STA 445/545, or any equivalent course approved by the instructor.

Term/Year: Fall 2018

Class Times: MWF 2:00 - 2:50 PM

Location: SH 509 (Smith Hall) [Blackboard Collaborate Ultra]

Academic Calendar: For beginning, ending, and add/drop dates, see the [Marshall University Academic Calendar](http://www.marshall.edu/academic-calendar/) (URL: <http://www.marshall.edu/academic-calendar/>).

Instructor: Dr. Avishek Mallick

Office: SH 743C

Office Phone: 304-696-3443

Marshall Email: mallicka@marshall.edu

Office Hours: MWF 10:00-11:00 AM
TR 2:00-3:00 PM and by appointment.

Required Textbook: *Introduction to Probability Models, 10th ed*, by Sheldon M. Ross. (ISBN: 9780123756862)

Publisher: Academic Press.

Desired Learner Outcomes: The table below shows the following relationships: How each student learning outcome will be practiced and assessed in the course.

Course Student Learning Outcomes	How students will practice each outcome in this Course	How student achievement of each outcome will be assessed in this Course
Students will have a good knowledge of the various types of stochastic processes (discrete or continuous time, discrete or continuous state space).	In class activities, intensive reading of relevant chapters and homework	Homework and exams
Students will have a reasonable knowledge of the variety of techniques which can be used to obtain probabilities and distributions arising in stochastic processes.	In class activities, intensive reading of relevant chapters and homework	Homework and exams

Course Requirements:

Homework: Homework assignments will be collected and graded. Make it a habit to do homework the same day they are assigned and turn in when they are due. Late assignments will only be accepted with an Excused Absence. Please read the university policy on how to secure an Excused Absence. Most excused absences are obtained from the Dean of Student Affairs. You are welcome (in fact encouraged) to collaborate with other students on homework, although you must turn in your own work, written in your own style and words. In cases where solutions require explanation and derivation, a one-number solution will not be accepted.

Calculator requirement: You may use a calculator on all work and assignments in this class. You are not allowed to use your phone, iPad, laptop, etc. as a calculator on any exam. No other technology may be used in class without permission.

Attendance/Participation Policy: Students are expected to attend all scheduled classes. It is the student's responsibility to find out what was discussed in a missed class. Although, attendance records will not be used to compute grades (except possibly in borderline cases), however, missing class can be expected to significantly reduce your chances of success. Note also that it is the student's responsibility to present approved notice of any absence that would be excused under the terms and regulations stipulated by the university.

Grading Policy and Exam Dates: All tests will be given during the regular class sessions. For makeup tests, please see the university's policy on excused

absences. The final grade will be based on the following components:

Homework	100
Exam I	100 [Friday, September 28] (tentative)
Exam II	100 [Friday, November 9] (tentative)
<u>Final Exam</u>	<u>100 (Comprehensive)</u>
Total	400

The semester grade will be based on the percentage of the total possible points, using the following scale:

A = 90-100% B = 80-89% C = 70-79% D = 60-69% F = 0-59%

FINAL EXAM: Monday, December 10 [12:45 – 2:45 PM]

Technology and Technical Skill Requirements

- Students must be proficient in the use of computers, the Internet, browsers, Microsoft Office Word, and other common applications.
- For computer and browser requirements, see “Get Connected” and “Internet Browser” at [Student Resources: First Steps](#). See also [IT: Recommended Hardware](#) (URLs: <http://www.marshall.edu/muonline/student-resources/> and <http://www.marshall.edu/it/recommendations/>).
- Students must be able to use MUOnline and Marshall Email. All pertinent course information and documents will be posted on our class MUOnline (Blackboard) page.
- Virtual (VC) courses may require a webcam and microphone to use Blackboard Collaborate Ultra for synchronous meetings. For the best experience, Blackboard recommends Google Chrome browser or Mozilla Firefox browser. Links to Blackboard Collaborate Help and Tutorials are on the Start Here page and on the Tech Support tab in Blackboard.
- [Adobe Acrobat Reader](#) may be needed to read some files. This plug-in is available free. (URL: <https://get.adobe.com/reader/>) See the Tech Support tab in Blackboard for additional information and links.
- See the Tech Support tab in Blackboard for additional information on browsers, technology, and apps.

Technology Assistance

If you have technical problems, please contact one or more of the following:

- [Blackboard Support Center](#) (URL: <http://marshall.edusupportcenter.com>)
- Marshall [Information Technology \(IT\) Service Desk](#) (Help Desk) (URL: <http://www.marshall.edu/it/departments/it-service-desk/>)
 - Huntington: (304) 696-3200
 - South Charleston: (304) 746-1969

- o [Email the IT Service Desk](mailto:itservicedesk@marshall.edu) (itservicedesk@marshall.edu)

University Policies: By enrolling in this course, you agree to the University Policies. Please read the full text of each policy (listed below) by going to [MU Academic Affairs: University Policies](http://www.marshall.edu/academic-affairs/policies/). (URL: <http://www.marshall.edu/academic-affairs/policies/>)

- Academic Dishonesty Policy
- Academic Dismissal Policy
- Academic Forgiveness Policy
- Academic Probation and Suspension Policy
- Affirmative Action Policy
- Dead Week Policy
- D/F Repeat Rule
- Excused Absence Policy for Undergraduates
- Inclement Weather Policy
- Sexual Harassment Policy
- Students with Disabilities (Policies and Procedures)
- University Computing Services Acceptable Use Policy

Students with Disabilities: For University policies and the procedures for obtaining services, please go to [MU Academic Affairs: University Policies](http://www.marshall.edu/academic-affairs/policies/) and read the section, Students with Disabilities. (URL: <http://www.marshall.edu/academic-affairs/policies/>)

Marshall University E-Mail Accounts

You must have and use your MU email account. Your personal email accounts will not be used for official communication with Marshall University programs and personnel. You may redirect your MU email to your own personal email account, but you must sign in to your MU account to do that. Marshall University uses Office 365 email. For more information, visit [Marshall IT: Office 365](https://www.marshall.edu/it/office365/) (URL <https://www.marshall.edu/it/office365/>).

Course Schedule: Here is a tentative schedule and order of topics which will be covered. This outline is subject to change based on the ability of the students and on the necessity to adjust the time for a given topic.

Tentative Topics:

- Review of Probability
- Conditioning – Probability and Expectation
- Markov chains
- Poisson Process
- Markov Processes
- Queuing Theory (if time permits)