



Marshall University Syllabus
College of Science
Department of Mathematics

Course: STA 445/545 – Probability & Statistics I

Section: 101

CRN: 4042/4049

Course Description and Objective: This course covers topics in Mathematical Statistics. Topics include probability, random variables, probability distributions, moments, probability functions, cumulative distribution functions, moment generating functions, random vectors, joint, marginal, and conditional distributions, independence, covariance, the distribution of functions of random variables, etc. The principle objective of the course is to introduce graduate and advanced undergraduate students to many topics in Mathematical Statistics and to prepare them for statistical inference topics like estimation and hypothesis testing as well as applied topics like regression analysis.

Prerequisites: Grade C or higher in MTH 231 or by permission.

Term / Year: Fall 2018

Class Times: MWF 1:00 - 1:50 PM

Location: SH 514 (Smith Hall)

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: *Mathematical Statistics with Applications*, 7th ed, by Wackerly, Mendenhall and Scheaffer. (ISBN: 978-0-495-11081-1)

Publisher: Brooks/Cole [Cengage Learning].

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 be able to do basic computation of probabilistic quantities by modeling sample spaces and applying rules of combinatorics, additive and multiplicative laws and conditional probability.	Students are required to participate in class discussions, intensive reading of relevant chapters, and most importantly, practice numerous end of the chapter exercises problems.	Homework assignments and exams.
Students will have understanding of random variables, distribution functions, probability mass functions, and probability density functions, including but not limited to the uniform, binomial, Poisson, exponential, and Gaussian distributions.	Students are required to participate in class discussions, intensive reading of relevant chapters, and most importantly, practice numerous end of the chapter exercises problems.	Homework assignments and exams.
Students will have understanding of multivariate distributions, independence, conditioning, and functions of random variables, including the ability to compute expectations, moments, and correlation functions.	Students are required to participate in class discussions, intensive reading of relevant chapters, and most importantly, practice numerous end of the chapter exercises problems.	Homework assignments 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	30%
Exam I	20% [Friday, October 5] (tentative)
Exam II	20% [Friday, November 16] (tentative)
Final Exam	30% (Comprehensive)

Percentage ranges for final grades are as follows:

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

FINAL EXAM: Friday, December 14 [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/>)

- o Huntington: (304) 696-3200
- o 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: I plan to cover Chapters 1 – 5 from the designated textbook. If time permits, we may discuss materials in Chapters 6 and 7.

Tentative Topics:

- Probability Theory including conditional probability, independence and Baye's Rule.
- Discrete random variables and their probability distribution.
- Continuous random variables and their probability distribution.
- Bivariate and Multivariate probability distributions.
- Functions of random variables. (if time permits)
- Sampling distributions and the Central Limit Theorem. (if time permits)